



IO2: Training paths, learning content structure and guidelines for lecturers

Main Author: Florin Ioras



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1 The aim of the ENSEC project and the learning programme

The field of Higher Education has been recognised as one of the key drivers within the EU2020

Strategy to overcome the socioeconomic crisis, to boost growth and jobs and to foster equity and inclusion. Moreover, one of the key priorities for HE is the reinforcement of the “Knowledge Triangle”, through the support of innovation, entrepreneurship and university-business cooperation. This specifically applies to those traditional sectors, such as the environment management sectors, where changes in education and training are required to equip the future workforce with the new skills for the new demands generated by the changing patterns of environment security (e.g.:

Climate Change/Population increase). Staff qualifications along with the ageing workforce and the inability to attract young workers remain one of the crucial points in these industries. This project intended to boost the training of competent staff in the environment security sector.

The aim was to develop an International Master’s Programme for the Environment Security sector in Europe. The new Master’s programme offers an adapted curriculum to equip the young generation with the specific, basic and transversal competences currently required in the environment management and related industries. This international Master Programme provides students with opportunities to gain additional skills by studying and training abroad.

For these reasons, this Strategic Partnership developed a flexible learning pathway in line with the needs of learners and companies in the environment management, security and related sectors. The project provided a joint study program between Higher Education and Vocational Education and Training that are providing enterprises innovation, expertise and added value.

ENSEC was a Strategic Partnership composed of seven entities from regions that are highly influenced by the environment management related industry: Four universities, two companies and one chamber of commerce representatives.

The consortium developed a Study Report on current skills needs on the European Environment Management and Security industry, a Joint Curriculum together with a learning content and an e-Learning platform that is freely and widely distributed. Four Multiplier Events have been conducted at the end of the project.

ENSEC contributes to the modernisation and reinforcement of education aligned to the needs and opportunities offered by traditional industries.

The project provides, assesses, and seeks the recognition of basic skills needed in the environment management sector. ENSEC also addressed transversal skills, such as entrepreneurship, foreign languages and digital competences. HE students and staff, and also everyone involved in the development of this initiative had the chance of increasing their sense of initiative and entrepreneurship, their competences in foreign languages and, of course, increasing their skills and capabilities for employability in an industrial sector which is the main key driver in many European regions. It is estimated that in the next five years there will be about 500 students benefiting directly from the educational materials developed within the project. These will become better equipped to contribute to the development of the Im sector, to fulfil the demand of highly qualified staff,

to foster entrepreneurship in the sector, to support the professional development of existing specialists. The fact that the Programme is taught in English facilitates the mobility of staff from one EU country to another and through this the integration is facilitated.

2 Short description of IO2

This output has defined and analysed the most suitable training paths according to the target groups. They were designed in terms of the necessary areas of knowledge and the pedagogical methodologies optimized to fit the variety of job profiles and the industry, by providing a core training path, as well as training modules and their units in languages to address the specific needs of certain job profiles. It also contains guidelines to support trainers and lecturers. Furthermore, the strategy for protecting the training materials under open licenses was described.

The Master's programme was based on the concept of Learning Outcomes.

Learning outcomes: *Statements of what a learner knows, understands and is able to do on completion of a learning process defined in terms of knowledge, skills and competence.*

Developing of materials related key topics like: How to study and understand climate change implications (short and long term). How do resources managers create solutions (case studies and practitioners). What are the different ways of doing applied research? Understanding Environmental Management research methods; literature, practice based outputs, designing research questions, studying art based approaches to investigation, evaluation methods, dissemination and impact.

The Masters to provide to the student to the enough knowledge of applied management that will allow him to make environment solutions for security of resources. For that, this pillar is the base of the ENSEC training course.

This Masters allows to students to build skill sets and knowledge base that will give opportunity to have a full comprehension of the environmental management processes. In reality SMEs will not always have the full compliment of environmental regulations and processes. It is therefore important that students have an appreciation of state of the art processes available to them through outsourcing. Graduates who find employment will be encouraged to complete CPD to maintain cutting edge knowledge of manufacturing possibilities which will contribute to the aim of the project to create environmentally sound solutions and are not limited by archaic 'outdated' knowledge.

These modules aims to prepare students for the complete process of environmental security considering conceptual thinking.

The Masters also aims to provide the student with all the regulation and standards related with the environment management aspects. For that, is a supporting pillar of the manufacturing process pillar that will lead the enterprise to the success in terms of barriers of environmental targets.

The activities conducted within IO2

were: IO2-A1-Training path definition

IO2-A2- Definition of learning content modules.

IO2-A3- Harmonization and validation of learning modules and training path.

3 Training paths development

Training (Learning) path (pathway) is normally described as the chosen route, taken by a learner through a range of (commonly) e-learning activities, which allows them to build knowledge progressively.

Training Path methodology uses a performance improvement approach to learning / training and defines a Training Path as the ideal sequence of learning activities that drives target users (participants) to reach proficiency in their knowledge / experience / job in the shortest possible time.

Creating a curriculum is one of the essential functions within an education or training system, as it constitutes the guideline for planning, conducting and assessing learning processes. Existing literature reveals that curriculum development can be approached from three different perspectives (Smith and Keating, 2003, p. 121):

The first perspective is to regard it as 'rational' or 'linear': i.e., it is a logical process that proceeds from objectives to the selection of learning experiences to the organisation of learning material to evaluation.

The second perspective sees curriculum development as a 'cyclical' model, where the whole learning process is a cycle that continually renews itself so that evaluation leads to the reformulation of objectives.

The third perspective shows an 'interactive' model that assumes curriculum development can commence at any stage and that feedback leads to constant change at any stage.

The two most commonly used methods for curriculum development – DACUM and functional analysis – can be rated and described as linear models. DACUM (an acronym to represent developing a curriculum) is a method to define systematically the tasks, jobs, competences and tools associated with a certain type of workplace. DACUM is an inductive approach that defines small units so that it is possible to gradually extend those units and apply them in a broad context.

Three assumptions are underlying DACUM: First, people who regularly perform certain activities can describe them in a realistic and precise manner. Second, an efficient means to analyse a job is to describe the tasks of a specialist precisely and completely. Third, every successfully completed task requires special knowledge, skills, equipment and behaviour, which can be identified implicitly through work and job analysis.

The job analysis that is required by DACUM includes several elements, such as the analysis of occupations, jobs, duties, tasks and single work steps. Additional issues such as workers' behaviour,

their general knowledge and skills, tools, equipment, supplies and materials, as well as future concerns, should be considered. Gonczi et al. (1990, p. 38) defined steps to be undertaken to set up and conduct a DACUM procedure:

1. First, it is necessary to choose an expert facilitator and select participants from various levels of the relevant occupation. Participants must have a profound knowledge of the occupation and it is important that different interests (e.g., educators, practitioners, unionists) are involved.
2. Second, a pre-DACUM session must be organised in order to explain the process of curriculum development. At the beginning of the session, the facilitator has to give a general introduction to and review of the occupational area. Then the main duties within the occupation must be outlined; associated tasks, sub tasks and required competences must be identified.

Additionally, the importance of each task, sub task and competence must be rated according to the frequency of its performance and its importance for a holistic work performance. The results must be structured and recorded for a final report, which is then disseminated to the relevant authorities.

The steps of a typical DACUM session are outlined below:

1. General introduction and orientation
2. Review of occupational area
3. Identification of the duties
4. Identification of tasks, sub-tasks and competences associated with each duty
5. Reviewing and refining the outcomes so far
6. Establishing importance of each task and /or competence by rating the frequency of performance, its degree of importance, etc.
7. Final structuring
8. Recording final results
9. Preparing final report.

Problems articulated regarding DACUM include the status quo of a job description being taken into account, and so methodical aspects, as well as assessment designs, are disregarded. To address this problem, a holistic approach to curriculum development is necessary. This determines not only learning targets in terms of competence standards, but also respective and appropriate assessment guidelines, as well as methodical support for teachers or instructors. However, it seems unrealistic to set-up appropriate procedures that generate elaborated curricula within a short period of time. Functional analysis is another method for curriculum development that is widely used in the UK in a variety of industries. Functional analysis is a deductive and target-oriented approach (Gonczi et al., 1990, p. 43).

In the analysis, the central task of an occupation is defined and complex functions are derived. Furthermore, basic sub-functions and simple tasks are derived from complex functions of the occupation. Therefore, functional analysis may be characterised as a process of disaggregating complex functions into smaller components, where functions are the defined outcome of a realised activity without describing the specific context of the activity. Functional analysis leads to small units and elements of competence that compose the design of a competence standard. One arising problem is that functions should be generally defined, although they are not necessarily suitable for all the different contexts. Another difficulty is that the complexity of work processes and occupations cannot be easily addressed simply by disaggregating complex functions into smaller units.

Although both functional analysis and DACUM are complex procedures that require sufficient expertise from practitioners, they depict the most commonly used methods for curriculum development in Competence-Based Education and Training. Other methods – such as expert interviews, questionnaires, and Delphi – could not be established as appropriate tools for curriculum development within Competence-Based Education and Training on a large scale.

3.1 Target groups

ENSEC consortium identified appropriate Target Groups (users/students/training participators) for the Master's curriculum, based on consortium partner's preliminary research and knowledge, discussion, identification and set up via project consortium regular communication and project meetings.

Tree (3.) Target oriented user groups were defined:

1. Managers
2. Post-graduate Students
3. Professionals

(technical engineers from various environment sectors).

3.2 Basic definition of target groups

Manager is a person engaged in management. Management / Business managers are responsible for overseeing and supervising a company's activities and employees. Small businesses rely on the business manager to keep workers aligned with the goals of the company. Business managers report to top executives in a larger organization, but in a small company, the manager might either own the company or report directly to the owner.

Types of Business Managers Business managers oversee the day-to-day operations in large and small organizations. In a big company, managers typically oversee an individual department, such as marketing, sales or production. In a smaller company, the business manager might oversee

operations in all departments. Office managers oversee the work of clerical or support staff in the business.

A post-graduate student is someone who is enrolled in a degree-granting program (either undergraduate or graduate) at an institution of higher education and registered full-time or part-time according to the definition of his/her respective public academic education institution.

Professionals in the case of ENSEC are mostly engineering technicians / technical engineers working in various thematic sectors or industries that are some kind involved in the resources management sector.

An engineering technician / technical engineer, is primarily trained in the skills and techniques related to a specific branch of engineering, with a practical understanding and has general fundamental engineering concepts. He often assist engineers and technologists in projects and research and development.

Professionals solve technical problems. They build or set up equipment, conduct experiments, and collect data and calculate results. They might also help to make a model of new equipment. Some technicians / engineers works in quality control, where they check environment products, do tests, and collect data. In environment manufacturing, they help to design and develop products. They also find ways to produce things efficiently. There are multiple fields in this job such as; software design, repair, etc. They may also be people who produce technical drawings or engineering drawings.

4 Definition of learning content modules

This document presents a preliminary framework of an International Master´s degree for the environment sector, including modules, subjects, units, abstracts. Changes may be necessary because Master could evolve during the development of the contents. For that, the distribution of the Master in this document is considered as a Draft.

- Point 4, there are an explanation about the main structure of the Master with the number of modules, subjects and units
- Point 5 and Point 6, these points are focused in the selection of the modules and subjects according precious steps of the project
- Point 7 is focused in the structure of the subjects
- Point 8 is referring to the responsible and collaborators entities in the moment of develop the content
- In Point 9 could be found the modules which are composing the Master
- Point 10 is about the 5 possible learning paths
- Finally Point 11 is focused in each subject with their content, units and knowledge, skills and capacities you could acquire.

5 Structure of the Master's programme

The Master, after studying the different possibilities and the received sector recommendations in previous output, it was decided that the following structure is the one which could have the best results:

- 5 training paths: Management, Business, Design, Research and No specialization
- 4 Main modules (compulsory) and 6 optional modules (10 modules in total), and Practices and Dissertation
- 18 Subjects (including Practices and Dissertation inside)
- 84 ECTS in total for a Master of 60 ECTS (one year)

It was created a draft structure of the Master with the following steps: Main Modules + Optional Modules + Practices + Dissertation

Main Modules will have 21 ECTS, Practices 12 ECTS and Dissertation 9 ECTS. At Optional Modules the student has to select 18 ECTS

It will be created 6 different Optional Modules with the composition of 2 linked subjects. According

to that Optional Modules, it will stablish the 5 different Learning Paths (Production, Business, Design, Research and No specialization)

Subjects of the Master were selected to add to the student curriculum the needed knowledges and skills has consensus according the survey and desk research that it was done in previous steps of this project.

6 Selection of the fundamental modules

The main modules were selected according the consensus of the sector with the obtained information in previous output.

It was selected 4 fundamental modules (or common to every students) which will be compulsory but no each one with have the same number of credits:

- Management – technology, process & maintenance – 7,5 ECTS
- Production – scheduling and planning – 7,5 ECTS
- Innovation, product & process improvement systems – 3 ECTS
- Fundamentals of enabling technology applications – 3 ECTS

The 3 first modules were the most selected ones to be included in a Master Degree for the environmental management sector at the survey and according the sector it has to be incorporated into the master (“Environmental Management– technology, process & resources” with 98% of votes, “Innovation, process improvement systems” with 97% and “Management – scheduling and planning” with 96%). “Fundamentals of enabling technology applications” has a really strong support of 88% in the survey

but it is slight smaller than other subjects, but in spite of this, it is considered by the consortium as an important tool for achieving the development of a Master which is looking to the future.

These fundamental modules represent 21 ECTS (60 ECTS are the total)

7 Selection of the optional modules and subjects

It is needed, at least, 18 ECTS of Optional Modules which will free to be selected by the students in their curriculum among the optional subjects.

The possible subjects that it would be integrating the Optional Modules are the following:

- Design – 3 ECTS
- Quality control – 3 ECTS
- Workplace, leadership & personal effectiveness competences – 3 ECTS
- Sales and Marketing – 3 ECTS
- Environmental processes – 3 ECTS
- Industrial Property Rights and Entrepreneurship – 3 ECTS

Moreover, in order to prepare the students to the environment research field, it would be added two additional subjects:

- Information Search and Retrieval – 6 ECTS
- Investigation Methodology – 6 ECTS

Each one of the optional subjects have 3 ECTS but ISR and Investigation methodology have 6 ECTS. These subjects will constitute 6 different modules of 2 unbreakable subjects; in fact, the student has to select modules and not subjects.

The selection of subjects to be part in the Master were done according the results of desk research and surveys across Europe and mainly in UK, Spain, Portugal and Romania. This joint Master needs to be complemented by other subjects, It is necessary to add a subject about “Sales and Marketing”, in that case, it is included 2 subjects of the survey in 1 (“Marketing” was selected by 87% and “Sales” by 84%). Finally it is added “Industrial Property Rights and Entrepreneurship” which it is inside “Fundamentals of standards – regulatory and technical”, it was selected by 86%

According to this, it is added to the Master every important request of the environmental management sector (beyond 87%), making it to be closest to the professionals of the sector and ensuring that the Master addresses the needs of wider community, indeed, it is a strong potential to make sure the sustainability. Moreover, it has to take into account that they are involved 4 universities of different countries, 2 SMEs providers and business representatives.

Finally, it is added to the curriculum “Information Search and Retrieval” and “Investigation Methodology”, as important step to train professionals in Research and Development (R&D), which have a positive correlation with resources management.

8 Harmonisation and validation of the learning modules and training paths.

Thus, there have been established one research and four professional Training Paths. Students will have the option, also, of not choosing one of them, so they would be *No Specialized*. All of them, nevertheless, will have to study four mandatory modules (21 ECTS): “Module 1 – XXXX”, “Module 2 – XXX”, “Module 3 – XXX” and “Module 4 – XXX”.

Depending of their choice of the six remaining modules, they will acquire their specialization:

- For Management, students must perform modules 1, 2, 3, 4, 5, 7 and 9.
- For Design, students must perform modules 1, 2, 3, 4, 6, 7 and 9.
- For Business, students must perform modules 1, 2, 3, 4, 5, 8 and 9.
- For Research, students must perform modules 1, 2, 3, 4, 10, and choose one from 5, 6, 7 or 8 depending on their investigation thematic.

At this point, it is needed to highlight that modules 5, 6, 7, 8 and 9 are only differentiated by a number, so it would be appropriate to name them in order to make more understandable the contents structure.

In conclusion, results of O2A1 and O2A2 are well harmonized, divided and planed. Even so, until the redaction of this report it has been detected some minor overlapping of the content between subjects, so it has been transmitted to the institutions responsible of the developing of the content of each subject. Most of them are between basic and specialization modules, so the different point of view grant that the students will acquire different competences based on the knowledges offered by the Master.

The entire content of this report has been discussed during Project Team Meeting 3, carried out in Funchal (Romania) February, 2019. Thus, it is considered that the learning modules and training paths are harmonized and validated.

9 Subjects framework

These subjects will have a similar framework to facilitate the study of the learners and their acquisition of knowledge and skills. Each subject will have, at least:

- Structure of different units inside each subject. Each unit will have an independent e-learning content to work in, learners could access to this content through e-learning platform which is developing in IO3
- Base support document with the development of the explanation of the subject. That document could be used by the student to achieve the required knowledge of this subject. The content will be ample and easy to understand without any extra support.
- Knowledge, skills and competences to be acquired or developed in the module
- Practical exercises in order that the learner could acquire skills or competences related

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to this subject and put into practice the achieved knowledge

- Assessment criteria of the subject with different suitable questions

Subjects and units will have different type of material according the necessities: videos, slides, bibliographic material, hands-on training session

The content of the modules, subjects and units will be done in English, however the consortium will analyze the possibility of releasing some of the content in Spanish, Portuguese and Romanian depending the necessities but the consortium agrees that it is a considered a language training for the learners to do the whole master in English. In this case, it will be possible for the students to learn professional terminology in English and it will be easier to improve their possibilities of working abroad. In spite of this, at least, the abstracts of each subject will be done in Portuguese, Romanian and Spanish too.

10 Development of the content

Each unit will be carefully reviewed and improved to make ensure a smooth transition between the different units in order that the subject has an internal consistency and without any redundant or missing part.

The development of each subject will be assigned to a consortium partner according their expertise as leader, the rest of partners will contribute to those subjects but following the instructions of the Subject Leader.

10.1 Leaders and collaborators of the modules and subjects

	BUCKS	BNU	UPM	UMA	EVM	CFIM	PA
	LEADER	COLLAB	COLLAB	COLLAB	COLLAB	COLLAB	COLLAB
	COLLAB	LEADER	COLLAB	COLLAB	COLLAB	COLLAB	COLLAB
	COLLAB	LEADER	COLLAB	COLLAB	COLLAB	COLLAB	COLLAB
	COLLAB	COLLAB	COLLAB	LEADER	COLLAB	COLLAB	COLLAB
	COLLAB	COLLAB	COLLAB	COLLAB	COLLAB	COLLAB	LEADER
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	LEADER	COLLAB	COLLAB	COLLAB	COLLAB	COLLAB	COLLAB

	COLLAB	COLLAB	LEADER	COLLAB	COLLAB	COLLAB	COLLAB
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	LEADER	COLLAB	COLLAB	COLLAB	COLLAB	COLLAB	COLLAB
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	COLLAB	COLLAB	COLLAB	COLLAB	LEADER	COLLAB	COLLAB
	COLLAB	COLLAB	COLLAB	COLLAB	LEADER	COLLAB	COLLAB

FM: Fundamental

Modules OS: Optional

Subjects COLLAB:

Collaborator

11 Moduels in the Master's programme

Modules are made to regularize the contents of the Master and make its structure easier to be understood. The 4-compulsory subjects of the beginning will be a fundamental module by itself:

MODULE 1 (FM): Environmental Management – technology, process & maintenance – 7,5 ECTS

MODULE 2 (FM): Security – scheduling and planning – 7,5 ECTS

MODULE 3 (FM): Innovation, process improvement systems – 3 ECTS

MODULE 4 (FM): Fundamentals of enabling technology applications – 3 ECTS

Fundamental Modules are forming the Main part of the Master; this compulsory part has 21 ECTS.

The rest of the subjects are Optional and they are part of possible selected Modules to follow the different learning paths. Specifically, it has been built 6 different Modules, with unbreakable subjects. The connection of the subjects in one module has been done according their similarities and joint content

MODULE 5 (OM): 6 ECTS

SUBJECT 1: Operations, business, & process management – 3 ECTS

SUBJECT 2: Quality control – 3 ECTS

MODULE 6 (OM): 6 ECTS

SUBJECT 1: Fundamentals – 3 ECTS

SUBJECT 2: Processes – 3 ECTS

MODULE 7 (OM): 6 ECTS

SUBJECT 1: Natural resources – 3 ECTS

SUBJECT 2: Management process – 3 ECTS

MODULE 8 (OM): 6 ECTS

SUBJECT 1: Legislation – 3 ECTS

SUBJECT 2: Quality – 3 ECTS

MODULE 9 (OM): 6 ECTS

SUBJECT 1: Workplace, leadership & personal effectiveness competences – 3 ECTS

SUBJECT 2: Industrial Property Rights and Entrepreneurship – 3 ECTS

MODULE 10 (OM): 12 ECTS

SUBJECT 1: Information Search and Retrieval – 6 ECTS

SUBJECT 2: Investigation Methodology – 6 ECTS

The learner has to select 18 ECTS of the OM (Optional Modules), in total Master has 42 ECTS of Optional Subjects.

Additionally, Master has two extra components in order of the needed 60 ECTS

PRACTICES – 12 ECTS

DISSERTATION – 9 ECTS

	Master	ECTS	
According to the next obtain of this Degree in environment sector.	FUNDAMENTAL MODULES	21	to this, the to follow structure to certification Masters' the
	OPTIONAL MODULES	18	
	PRACTICES	12	
	DISSERTATION	9	

12 Learning paths

In accordance with the selected subjects, it has built different learning paths that the learner could chose to build their knowledge, skills and competences in the matters that they prefer according their necessities.

Management SPECIALIZATION

In this specialization, besides of the main training, the student is receiving information closer to how the various resources are managed; it is included the study of the management process, the control of the quality in environment, introduction of new technologies in the production, selection of appropriate solutions, how to understand technical implications, eco-sustainability. Finally, it is added other concepts as leadership skills, more connected to improve the employment relationship, and principles related with the protection of intellectual property and entrepreneurship.

MODULE 1 (FM): Resources Management – technology, process & maintenance – 7,5 ECTS

MODULE 2 (FM): Environment Security– scheduling and planning – 7,5 ECTS

MODULE 3 (FM): Innovation, product & process improvement systems – 3 ECTS

MODULE 4 (FM): Fundamentals of enabling technology applications – 3 ECTS

MODULE 5 (OM): 6 ECTS

SUBJECT 1: Operations, business, & process management – 3 ECTS

SUBJECT 2: Quality control – 3 ECTS

MODULE 7 (OM): 6 ECTS

SUBJECT 1: Resources – 3 ECTS

SUBJECT 2: Quality process – 3 ECTS

MODULE 9 (OM): 6 ECTS

SUBJECT 1: Workplace, leadership & personal effectiveness competences – 3 ECTS

SUBJECT 2: Industrial Property Rights and Entrepreneurship – 3 ECTS

PRACTICES – 12 ECTS

DISSERTATION – 9 ECTS

ENVIRONMENTAL DESIGN SPECIALIZATION

In this specialization, besides of the main training, the student is receiving information closer to how environmental design solutions are conceived and how it is created the application according to that idea; it is included the use of ICT in the development of design project, the application of creative strategies, the design history, the study of methods for the realization of virtual prototypes, also, selection of appropriate materials and their properties, how to understand technical specifications, eco- sustainability in the design process. Finally, it is added other concepts as leadership skills, more connected to improve the employment relationship, and principles related with the protection of intellectual property and entrepreneurship.

MODULE 1 (FM): Production engineering – technology, process & maintenance – 7,5 ECTS

MODULE 2 (FM): Production – scheduling and planning – 7,5 ECTS

MODULE 3 (FM): Innovation, product & process improvement systems – 3 ECTS

MODULE 4 (FM): Fundamentals of enabling technology applications – 3 ECTS

MODULE 6 (OM): 6 ECTS

SUBJECT 1: Environmental solutions– 3 ECTS

SUBJECT 2: Design – 3 ECTS

MODULE 7 (OM): 6 ECTS

SUBJECT 1: Resources – 3 ECTS

SUBJECT 2: P rocess – 3 ECTS

MODULE 9 (OM): 6 ECTS

SUBJECT 1: Workplace, leadership & personal effectiveness competences – 3 ECTS

SUBJECT 2: Industrial Property Rights and Entrepreneurship – 3 ECTS

PRACTICES – 12 ECTS

DISSERTATION – 9 ECTS

BUSINESS SPECIALIZATION

In this specialization, besides of the main training, the student is receiving information closer to manage the company, it is more connected to financial results of the organization, obviously it is included aspects of environmental security in order to the better understanding of the whole process. Also, it is included the operations strategy, business management, the examination of the benefits, control of the quality, implementation of a WMS. Finally, it is added other concepts as leadership skills, more connected to improve the employment relationship, and principles related with the protection of intellectual property and entrepreneurship.

MODULE 1 (FM): Environmental Security – technology, process & maintenance – 7,5 ECTS

MODULE 2 (FM): Resources management – scheduling and planning – 7,5 ECTS

MODULE 3 (FM): Innovation, product & process improvement systems – 3 ECTS

MODULE 4 (FM): Fundamentals of enabling technology applications – 3 ECTS

MODULE 5 (OM): 6 ECTS

SUBJECT 1: Operations, business, & process management – 3 ECTS

SUBJECT 2: Quality control – 3 ECTS

MODULE 8 (OM): 6 ECTS

SUBJECT 1: Logistics– 3 ECTS

SUBJECT 2: Marketing – 3 ECTS

MODULE 9 (OM): 6 ECTS

SUBJECT 1: Workplace, leadership & personal effectiveness competences – 3 ECTS

SUBJECT 2: Industrial Property Rights and Entrepreneurship – 3 ECTS

PRACTICES – 12 ECTS

DISSERTATION – 9 ECTS

RESEARCH SPECIALIZATION

In this specialization, besides of the main training, the student is receiving information closer to the investigation in the environmental security field. It is proved that new developments, materials, design... are crucial factors in the sector. It is necessary to reinforce the connection between science and environment sector. It is included how to seek information, how to establish objective in the search of information, the scientific method, development of an investigation, how to share the results. Moreover, it will be added aspects of other learning paths, focused in the interests of the student about their future specialization inside the environment field.

MODULE 1 (FM): Management – technology, process & maintenance – 7,5 ECTS

MODULE 2 (FM): Security– scheduling and planning – 7,5 ECTS

MODULE 3 (FM): Innovation, product & process improvement systems – 3 ECTS

MODULE 4 (FM): Fundamentals of enabling technology applications – 3 ECTS

MODULE 10 (OM): 12 ECTS

SUBJECT 1: Information Search and Retrieval – 6 ECTS

SUBJECT 2: Investigation Methodology – 6 ECTS

MODULE 5, 6, 7, 8 or 9 (OM): 6 ECTS

SUBJECT 1: – 3 ECTS

SUBJECT 2: – 3 ECTS

PRACTICES – 12 ECTS

DISSERTATION – 9 ECTS

NO SPECIALIZATION

The students could select the modules that they think more useful for their future integration into the workforce of the sector. In this case, they are learning about different areas according their personal interests.

MODULE 1 (FM): Environmental engineering – technology, process & maintenance – 7,5 ECTS

MODULE 2 (FM): Production – scheduling and planning – 7,5 ECTS

MODULE 3 (FM): Innovation, product & process improvement systems – 3 ECTS

MODULE 4 (FM): Fundamentals of enabling technology applications – 3 ECTS

MODULE 4, 5, 6, 7, 8 or 9 (OM): 6 ECTS

SUBJECT 1: – 3 ECTS

SUBJECT 2: – 3 ECTS

MODULE 4, 5, 6, 7, 8 or 9 (OM): 6 ECTS

SUBJECT 1: – 3 ECTS

SUBJECT 2: – 3 ECTS

MODULE 4, 5, 6, 7, 8 or 9 (OM): 6 ECTS

SUBJECT 1: – 3 ECTS

SUBJECT 2: – 3 ECTS

PRACTICES – 12 ECTS

DISSERTATION – 9 ECTS

13 Breaking down modules, subjects and Learning Units

MODULE 1 (FM):– 7,5 ECTS

LEADER TO DEVELOP CONTENTS: BUCKINGHAMSHIRE NEW UNIVERSITY

UNITS

- **UNIT 1:**

- **UNIT 2:**

- **UNIT 3**

- **UNIT 4:**

- **UNIT 5:**

- **UNIT 6:**

MODULE/SUBJECT:		
Knowledge	Skill	Competence
• Explain why it is important to design interactive products that are usable.	• Management of learning and ability to reflect on development	• Carry out research and apply creative strategies for

MODULE 10 (OM): 12 ECTS

SUBJECT 1: Information Search and Retrieval – 6 ECTS

SUBJECT 2: Investigation Methodology – 6 ECTS

LEADER TO DEVELOP CONTENTS:

SUBJECT 1: Information Search and Retrieval – 6 ECTS

In this subject, students will have the opportunity to learn how to seek for information, gather and analyse it in a useful and properly way. Thus, it is aimed to all students, not only those whose objective is the scientific research, although it is mandatory for them.

Thereby, we establish a main objective in the search for resources of information of any class, so that in that way, students may be able to recover it. For that, they will be taught about how to analyse the sources of information to discriminate those which are interesting for their work.

Special attention to the web and its possibilities will be granted so as techniques of information retrieval applied to environment sector as well as for scientific research.

Thus, the subject begins with an overview importance of the web, because it's huge incidence and resources, so the students could know the methods, techniques and tools for a useful internet search. This, in the society of the *disinformation*, due to the big amount of data available, it is more obvious that skills in the search and process of this data are needed.

Therefore, this knowledge will provide students the ability of reinforce and accelerate communication between science and the environment sector: it stimulates paper publication, distance learning and it's a useful tool for marketing.

UNITS:

- INFORMATION, SEARCH AND RETRIEVAL

SUBJECT: INFORMATION SEARCH AND RETRIEVAL		
Knowledge	Skill	Competence

<ul style="list-style-type: none"> • Information retrieval on the web • Information retrieval evaluation • Applied techniques to science research • Utilities, tools and problems • Data collection and evaluation techniques 	<ul style="list-style-type: none"> • Gather and interpret relevant data • Develop the necessary learning skills to undertake later studies with a high degree of autonomy • Work in teams and communicate their own ideas by creating an enabling environment, as well as the ability to integrate into a common project aimed at obtaining results • Identify the strengths and weaknesses of an organization, a product or a service, establish and use indicators, develop solutions to improve quality • Obtain, process and interpret data 	<ul style="list-style-type: none"> • Manage online resources • Basic education for autonomous research • Team work • Recognise quality factors • Understand big quantities of information
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SUBJECT 2: Investigation Methodology – 6 ECTS

In this subject we set out to achieve various general objectives. The first of them is to introduce the students to the world of research, so that from this knowledge they can investigate through the optimal use of techniques, methods and documentary resources. This way, there will be set the bases so that students can start to contemplate research as a possibility for working in the environment field, such as the dissertation and doctoral thesis. For that, students will be taught about each and every one of the stages of the investigation and qualitative and quantitative research techniques.

At the beginning of the course, there will be presented the ethic bases of modern science, while the students learn how the scientific method works. Thus, they will know the meaning of the investigation, its function in the environment and wood sector, its typologies and each of one of the

stages that compose it. Consequently, they will have the knowledge of how to develop an investigation in the correct way, no matter if it's by themselves or as a part of a collective.

As the students will know how to research, next step taught is how to share their results, i.e. how to find a scientific publication, and to prepare their results. In order to find a proper publication, there will be space for quality indicators and impact index. In the same direction, this information will provide them the resources for keeping their knowledge updated.

Finally, two more topics will be attended: scientific meetings and research projects so that the individual formation acquired until then could be used to achieve greater goals.

UNITS:

- INVESTIGATION METHODOLOGY

SUBJECT: INVESTIGATION METHODOLOGY		
Knowledge	Skill	Competence
<ul style="list-style-type: none"> • Science and philosophy of science • The investigation. Meaning, function, typology and stages • Personal and collective ethics of research • Scientific publication • Methods of updating knowledge • Scientific meetings • Research projects 	<ul style="list-style-type: none"> • Acquire the knowledge of the general framework in which experimental science is developed • Know of the requirements of the scientific method and its philosophical foundations • Know the ethics of the researcher's activity • Identify how to present a project to get funding • Integrate in a scientific community • Gather and interpret relevant data 	<ul style="list-style-type: none"> • Basics of scientific method • Research integrity • Projects making • Team work • Understand big quantities of information • Basic education for autonomous research

	<ul style="list-style-type: none">• Develop the necessary learning skills to undertake later studies with a high degree of autonomy	
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PRACTICES – 12 ECTS

This part involves a traineeship abroad for the student.

This Master is a construction of 4 Universities of 4 different countries (Spain, Portugal, UK and Romania) and 3 partners with direct contact with relevant sector (2 SMEs who are working with more than 100 enterprises and the Madeira Chamber of Commerce); in this subject, the contact between the partners will be really important and the fact of the idea of the implementation of the Master in these 4 countries.

These practices will consist in a traineeship period in a company in a different country where the student is doing the Master. The student has to put in practice the knowledge, skills and competences that they have acquired during the Master. For that, this subject will be always done, in the moment that the student has passed the rest of contents of the Master (except “dissertation” that it could be done after “practices”).

In this subject it will be an organisation who will be responsible of the student, this one will be the university where the student is doing the Master, and a Host Intermediary organisation who will be the responsible of the host enterprise in the country where the student is going.

Both organisations have the obligation of providing help and assistance during the length of “practice” subject.

The student has to prepare a full CV including their professional experience, moreover, the student has to add his interest about the possible kind of enterprise and tasks that he/she want to do there.

With that information, the Host Intermediary organisation will look for the most appropriate enterprise to receive the student according his interest. It is important that the proposed host enterprise has proven experience in environment sector and could give the student tasks that will give him relevant learning opportunities, for that, the host has to describe previously the activities that the student could do during the traineeship. It is important that in the host organisation there will be a person who speaks English fluently. Finally, a CV of the organization will be prepared.

After the proposal of the host enterprise, the student has to accept or refuse with justified reasons the offer. In case of refuse, it will be offered a second organization, in case of acceptance, it will make the practice commitment between them according the length of stay

Report: 102-*Trainig path, learning content structure and guidelines for lecturers* (including hours per day) and tasks.

Intermediary organisations must ensure that student and host enterprise are aware that they may need to sign agreements as those ones related with confidentiality.

Before going abroad, the student should participate in a pre-departure induction course of 5 hours in order to be prepared for the traineeship.

The duration of stay abroad is two months at least and four months at maximum, depending the number of hours per day until completing 200 hours of practice. This stay could be completed in multiple periods

At the end of the traineeship, the student has to prepare an explanatory document about the apprenticeship, including their tasks, the skills that he/she has acquired, the achieved goals... and a presentation of 30 minutes in order that the tutor could consider if the student has used this period abroad with benefits.

In order to sum up, this “practices” will have 12 ECTS: 5 hours of pre-departure induction, 200 hours of traineeship in an enterprise, 80 hours of preparing the explanatory document and the presentation and 15 hours of mentoring program to solve doubts of the student.

DISSERTATION – 9 ECTS

It consists in the application of every knowledge, skill and competence that they have been developed during the Master. The student has to prove that they have achieved the goals that this Master has planned. The student has to develop an innovative project related to one of the subjects of the Master. Each partner will have assigned a tutor who will give an academic support but he/she will not be the liable of the final result. The tutor will be assigned after the students have selected the subject to prepare their project. After this, the tutor could give different wide possibilities inside each subject.

The tutor could give some information to the student about Module 10 - Investigation Methodology I and II in case of necessity; and give some notions about what is the final objective with this “Dissertation”. Innovation could be applied to any part of the project (contents, methodology, materials, tasks...)

Project may have between 45-55 pages, including, if it is appropriate, the index, bibliography and references and annexes.

It will be included, among other things, the following parts:

- Justification of the project

- Theoretical framework – state of art
- Objectives
- Personal reflection
- Bibliography

The student has to defend the project, the final mark in this subject would be split in 40% corresponding to the public exposure and 60% corresponding to the quality of the project. The oral presentation will last between 12 to 15 minutes, accompanied by a round of questions, comments and suggestions from the evaluating members. After that, the student will have the chance to clarify, specify or answer to the asked questions.

14 Guidelines for trainers

A commitment was made within the ENSEC project to develop Guidelines for the Trainers involved in delivering the content for the training material for the “Master programme”. The Guidelines below are largely based on materials produced by (a) European Centre for the Development of Vocational Training (Cedefop), (b) the City and Guilds Centre for Skill Development in the UK, (c) the Handbook of VET Providers, published by Human Capacity Development (HCD) for Vocational Education and Training produced (Mannheim), Germany. The ideas presented in these Guidelines could be read by all those engaged in Master’s as a standalone

text that could guide the thinking and the practice of preparing young people for any profession at vocational level. The intention is to offer readers an opportunity to reflect on their own practice and to enrich it by exploring what others do successfully. The bibliography at the end could serve as a tool for those who intend to explore in more depth some aspects of teaching and learning at all levels but mostly connected to Master’s education.

14.1 Basic concepts utilised

It is assumed that all those involved in teaching within HE institutions are qualified and possess an adequate level of knowledge and practical skills. The guidelines intention is just to remind teachers of the main elements that are considered ‘good practice’ at a European level. The framework developed by Hopkins, 2007 has been widely used in Europe as it highlights key elements that should be considered for effective teaching – Teaching Skills, Teaching Relationships, Teacher Reflection and Teaching Models. The framework is widely used to analyse examples of vocational teaching and learning in practice. The ‘framework’ contains essential components that could guide the novice or the advanced teacher and synthesises the best practice.

Teaching relationships

- It is widely admitted that teachers’ commitments to their learners – the relationships they develop with their learners and the range of roles that teachers take – are crucial components in VET as well as in any other educational environment at all levels.
- Teaching relationships refer to the relationships teachers develop with their learners as well as how learners relate to each other. The tutor-learner relationships are identified as

Report: 102-*Trainig path, learning content structure and guidelines for lecturers* 'the most important link in the learning process', (TLRP, 2006). A meta-analysis of learner-centred teacher-learner relationships confirmed its importance. It seems that positive teacher-learner relationships are associated with optimal, holistic learning with above average mean correlations when compared with other educational innovations for cognitive and behavioural outcomes (Cornelius-White, 2007).

- The way in which a teacher interacts with learners sets the scene for the subsequent learning to take place. Teachers felt that their relationships with learners were of prime importance for the teaching and learning to be effective. The features of effective teacher relationships included:

Getting to know learners, knowing which learners need more attention

Good rapport – listening, high expectations

Building trust

Humour – used appropriately and never descending to sarcasm

Relaxed atmosphere – relaxed learning with elements of fun Mutual respect – respect of other people's opinions

Behaviour management – so that all of the group have the chance to learn.

Active learning, while carrying out assignments or projects, for instance, gives many opportunities for teachers to build relationships with learners. The teacher's role during this activity can take various forms: demonstrator, organiser, coach, mentor, facilitator, reflector and even co-learner. A relationship of trust between the teacher and learners is likely to develop while working together and discussing issues at various stages of the assignment, so that the teacher becomes an 'accomplice' in the learning process rather than the knowledge base.

Teaching models

Research conducted in Europe highlights the fact that few teachers use a particular model or strategy with clear intent. The way in which teaching takes place is strongly influenced by a series of circumstantial and educational factors. Models are prescribed structured sequences, which are designed to elicit a particular type of thinking or responses, to achieve specific learning outcomes. However, it is very useful for teachers to understand the concept of a teaching model and to comprehend the main features of the many existing models.

Teaching models are derived from theories about teaching and learning. Each model can be described as a structured sequence, which is designed to elicit a particular type of thinking or response, to achieve specific learning outcomes. The choice or use of the appropriate model, or combination of models, is influenced by the type of learning objective and nature of the learner as well as other factors such as teaching strategies and teaching skills. A strong body of research and practice suggests that the consistent use of specific models can make learning more effective (DfES, 2004, Hattie, 2009 and Marzano, 1998).

The term 'teaching model' has been used to describe many other approaches. In different documents a number of terms appear to be used interchangeably – models, strategies, approaches, techniques, and methods name just a few. Teaching models are not the 'real world' but merely a way of helping us understand and think about teaching. There are a vast number of teaching models – some are variations of others – and they come in many shapes, sizes, and styles. Some terms, such as 'demonstration', can be used for both a teaching model and also a strategy or method. To draw the distinction between a teaching strategy and a teaching model, the definition of a used teaching model has two distinctive

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features. The first distinctive feature is the nature of the learning objective and outcome required and whether the learning is related to:

- Acquiring and learning skills, procedures, knowledge, and the like, or
- Processing information, building concepts and rules, generating and testing hypotheses and thinking creatively, or
- Collaboration and learning together to construct new knowledge and understand concepts.

The second distinctive feature is the structured sequence of steps or phases (the syntax) used to achieve that particular type of learning objective. In teaching models, it is the tight linkage between these two aspects that defines a teaching model. Strategies do not have the same linkage and may be deployed more widely, as an essential part of a teachers' repertoire to achieve a range of learning outcomes.

- The term teaching model is also used in vocational teaching and learning to describe other different concepts. If these concepts lack the distinctive linkage between the two particular features above, then they are not what is mean here by a teaching model.
- In developing teaching models in the vocational context, it is useful to compare teaching models to find the similarities and differences between the models. This could then serve as a guideline to teachers when selecting or adapting a teaching model or combination of models. The work of Ji-Ping and Collis (1995) offers suggestions for comparing models using a set of appropriate questions to answer against each teaching model. With adaptation, this could provide a useful basis for further work in vocational learning. There are four aspects suggested: teacher aspects, learner aspects, the degree of flexibility or adaptability of the models and aspects related to effective theoretical and technological supports. The following are some specific questions for each aspect that can be used in a comparison of teaching models.

1. Teacher Aspects

- a) How easily can the average vocational teacher manage the model?
- b) To what extent does the model save teaching time (including preparation time for the lesson)?
- c) How likely is it that the model will be accepted and used by the average teacher?
- d) To what extent does the model give full play to the teacher's professional knowledge or skill?

2. Learner Aspects

- a) How much initiative is given to learners within the model?
- b) How adaptable is the model to individual differences in the learners?
- c) How well can the model be adapted for learners of different ages?
- d) How well can the model be adapted for different sorts of learning goals?

3. Flexibility and adaptability

- a) How easily can the model be adapted to the present organisational system in the vocational area and to the current standards for learner assessment?
- b) Can the model be well adapted to a variety of vocational areas?

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- c) How easily can the model be combined with other models?
 - d) To what extent is the model adaptable to cultural expectations for learner and teacher behaviour?
4. Theoretical and Technological Supports
- a) Was the model developed using an appropriate theory?
 - b) How much research and evidence are available to show the model is internally valid?
 - c) In what ways might the model be well supported by technologies and media?
 - d) Are the technologies and media most suitable to the model readily available?

This structure for analysis of models could offer a good starting point to begin to identify which teaching models are most appropriate for vocational education and to identify the relevant aspect of each of the teaching models.

Direct teaching and programmed learning

Direct teaching, one of the 'classical' ways of teaching is particularly effective in enabling learners to acquire skills. It is a very structured approach involving a high level of interactivity which is teacher- directed and involves direct communication usually with a whole class, although it might be undertaken with an individual or a small group of learners. Direct teaching has the highest level of effect among the range of teaching strategies, though this may be in part because 'Direct Instruction' is a 'Russian Doll' that includes many other strategies such as active learning, reviews, and homework, so there is an additive effect (Petty, 2009). This model usually involves direct input from the teacher together with a strategy of modelling or demonstration and clear instructions to the learners. The teacher then checks the learners' skills or understanding, provides guided practice and ultimately the learners undertake independent practice.

Programmed learning is a self-paced, self-administered programme (computer based for example)

presented in a logical sequence and with much repetition of concepts or skills.

- Sequence of Activities syntax
- The lesson starts with the learners all at the same stage and the teacher employs direct teaching.
- *Phase 1* – In the first session, the teacher logs on to the computer with the screen visible to the learners on the wall and the learners log on to their computers. The teacher draws the square first, as it's the easiest. The teacher clicks on the line tool and tells the learners to find and click on the line tool. The teacher draws a line of a given length, 45mm. As she demonstrates, she describes what she is doing.
- *Phase 2* – The learners select the tool and draw the line of 45mm and then draw a square.
- *Phase 3* – The teacher questions the learners and checks their progress, guiding them as required.
- *Phase 4* – Once they are confident, learners practise by drawing squares of different sizes on their own.

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- The teacher demonstrates the tools necessary to draw a circle and the cycle of phases repeats.

The session proceeds step-by-step until all the tools and skills have been covered. When an individual learner is stuck, the teacher sits next to the learner, takes the mouse, demonstrates and describes what to do, then asks the learner to do exactly the same. If the learner makes a mistake, the teacher explains what is wrong and makes the learner repeat the task correctly. The learner practices until the skill is established and the teacher does not take the mouse again but might point to the main screen or question and prompt the learner if required.

Direct teaching using physical guidance

In a design session, the teacher provides direct teaching with physical guidance to help learners acquire the learning objective of mastering the skill of modelling. In terms of context, the session takes place in a workshop. The teacher is also concerned with his relationship with the learner. He is very aware of the issues of personal contact and invading personal space so ensures that he has the learner's consent for physical contact. The teacher guides the learner and progressively removes his support, a process described as 'scaffold' learning.

- Sequence of activities
(syntax)

- The teacher had previously demonstrated modelling.
- *Phase 1* – The teacher asks the learner if he minds if he guides his hands; the learner agrees. (The teacher points out that if the learner had objected, he would not have done so.)
- *Phase 2* – The teacher holds both of the learner's hands as he starts to model because the learner does not yet have the fine motor skills.
- *Phase 3* – The teacher tells the learner that she is slowly going to take her hands away and she wants the learner to carry on. (She explains that if she had just removed her hands without warning, the learner's hands would have gone up).
- *Phase 4* – The teacher removes her hands and the learner continues to model unaided. The teacher comments that it is a contentious technique but it is an effective way of teaching someone to model. She points out that often they hold the mould too far away from the work. Teaching them the right distance is important, as the learner needs to operate safely. 'If you tell them to go closer they might go too close and then the model could dip into the pool and splash.'

Direct teaching using demonstration

There are a number of ways of implementing the direct teaching model. The model presented here is known as the 'PAR' model: 'Present, Apply and Review', which is a structured-skills version that could be suitable for many vocational areas.

- There are three stages:
 1. Present new material
 2. Apply this new learning (learner activity)
 3. Review the skills learned in this lesson.

The teacher in this session uses the teaching model of direct teaching and the strategy of demonstration as the tool, in this case, to present new material and achieve the learning objective of acquiring the skill of technical drawing.

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- Sequence of activities (syntax)
- *Phase 1* – The teacher sketches a drawing on the white board. This is done in stages, to teach the learners how to do a technical drawing.
- *Phase 2* – The learners copy the drawings stage by stage, as the teacher does them.
- *Phase 3* – Once the learners have completed their drawings, the teacher talks about what they have copied, goes round to each learner and provides feedback, praising good drawings and indicating where they need to improve.

The teacher points out the importance of being able to draw so the customer can see exactly what the technical specialist is intending to do...‘and this is why tradespeople should be able to express themselves not only in the written word but in sketches.’

Enquiry

The use of the enquiry model helps learners to collect information, build concepts and test hypotheses.

Sequence of activities (syntax)

- *Phase 1* – The teacher welcomes the learners and outlines the learning objectives for the day. She provides five questions relating to, for example, health and safety statistics and directs the learners to the Health and Safety Executive website.
- *Phase 2* – The learners search to find the answers and record their answers. While they are doing this, the teacher informs them that they will be asked to give a brief presentation of their findings.
- *Phase 3* – The teacher asks for volunteers to present their findings.
- *Phase 4* – Following the presentations there is class discussion facilitated by the teacher.
- *Phase 5* – The evaluation phase is not completed in this session but there is a short quiz and recap in the next session in terms of what was hard and what was easy, what they needed to be aware of.

The teacher knows from experience that by simply telling the learners the relevant statistics, those learners would think it was ‘boring’ and would be unlikely to remember the information. Through the use of this model, the learners are actively engaged in researching the information and the impact is increased by the presentation of their findings to the rest of the group, thus reinforcing the learning. The teacher’s skill is used to ensure that over time *all* learners present their findings, not just the ones that volunteer as they will probably comprise a relative minority.

Developing higher-order skills

Often teachers are actively attempting to develop learners’ thinking and learning skills in addition to meeting the course requirements. The development of higher-order skills is important for transition between qualification levels and also as 21st century employability skills.

For example the learning objective is concerned with developing the learners’ higher-order research and analytical skills. Although the task involves developing their knowledge about computer-assisted design systems and developing concepts involving deductive reasoning and comparing systems, the teacher suggests that it is the development of the higher order

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skills that is important. These are the skills that the learners will need to be able to use in the workplace.

- Sequence of activities (syntax)
- *Phase 1* – The teacher provides learners with information about user needs.
- *Phase 2* – Learners have to carry out research on their own. They have to analyse systems, to compare systems, to identify what components could improve the system and the reasons why.
- *Phase 3* – The learners report back and justify the suggestions they make for improving the systems.

The teacher indicates that through the activity, the learners are developing research and analytical skills – the type of skills they will need in the workplace – without really realising they're doing it. 'They'll be just asked to carry out the task, but underpinning that they're looking

at those higher order skills where they're researching, they're analysing computer systems – different computer specifications. They're suggesting upgrades, they're justifying the upgrades for it – and not just listing them; they 're justifying why that's a justifiable upgrade to that particular system.'

Constructivism, group investigation

Group investigation attempts to recreate a democratic atmosphere in the classroom where the learners work together to solve a problem. The contribution of each member of the group makes the outcome better than if individuals do it. Group investigation puts the learners in charge of the learning and allows them to investigate what interests them most. (Sharan and Sharan, 1989).

- Group investigation goes beyond cooperative learning and follows the following six steps:
- Learners are given a problem
- They discuss ways to solve it
- They plan how to carry out the investigation in a group and assign roles
- They work together and independently
- They analyse progress and report findings, and the process is evaluated (Abordo and Gaikwad, 2005).

The example below shows some of the elements of constructivist learning and group enquiry while not following the entire model. The learning objective is for learners to be able to identify the country and age where a certain environment object is located. The teacher in a history of design session helps learners to construct knowledge about the history of environment design and where in the world objects are located. The teacher initially draws on learners' current knowledge and experiences. She then introduces concepts of known and unfamiliar environment object and then arranges a series of tasks to enable learners to construct their knowledge of both location and period of time when these were produced.

- By asking the learners to produce displays, the teacher could assess the learners' new knowledge by seeing what they had found and by asking them questions.

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- Sequence of activities

(syntax)

- *Phase 1* – To introduce the topic, the teacher provides the learners with a sheet giving an overview of pieces of environment and their location in time and space. She then leads a discussion by picking out one of the destinations and asking who has seen similar pieces. The discussion is split between European and worldwide attractions and includes famous environment objects such as the thrones of different monarchs – objects with which learners are familiar, even if they have not seen one.
- *Phase 2* – The teacher shows a short video of an unfamiliar environment style – the rocking chair of Churchill – and indicates where it is located.
- *Phase 3* – The teacher gives the learners an A4 copy of the map of the world and lots of environment brochures and magazines. The task is to find pictures in the brochures of as many famous environment artefacts as possible, to indicate on the world map where these objects are located, and to make a display on a large sheet of paper. The learners look at the Atlas to identify the locations and the year.
- *Phase 4* – The learners have to research two interesting facts about each environment piece to add to their displays. They also have a environment design guide that they can use.

Constructivism using debate

In this case, the teacher used a learning activity in the form of a debate to enable learners to develop their concepts and understanding of the differences between two different types of tools. There was a subsidiary learning objective to this activity, developing the skills necessary for a debate. The functional skills of communication and listening were thus embedded in the activity.

- Sequence of activities

(syntax)

- *Phase 1* – The teacher gives each group of learners' specifications of different carving tools together with the advantages of each.
- *Phase 2* – Each group has to decide how to present the advantages of the carving tool.
- *Phase 3* – The teacher explains and writes up the rules for the debate: listening, not butting in, keeping eye contact etc.
- *Phase 4* – Each group has 5 minutes to decide how to use their tool and the others then have to work out what the advantages and disadvantages of it might be.
- *Phase 5* – The teacher chairs and opens the debate to the floor for questions. The teacher then employs teaching skills to ensure that every learner contributes.

Cooperative learning using scenarios

In cooperative learning, groups of learners work in small groups to maximise their own and each- others' learning. Derived from the work of Slaving (1995), the elements in the cooperative learning teaching model are: clear and positive interdependence between learners, face-to-face interaction, individual accountability, an emphasis on interpersonal and small-group skills, and group review to improve effectiveness.

The teaching model in this example has elements of cooperative learning and the strategy employed is the use of a scenario. The learning objective of the session is, for example, to use the information provided in a scenario to produce a typical risk assessment. As part of the context for this session, the learners are employed and the activity requires them to draw on

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their experience to identify the hazards in a environment-manufacturing workshop.

Sequence of activities (syntax)

Phase 1 – The teacher introduces the session and provides a scenario of a workshop hosting a series of tools and machines in which there are many hazards.

Phase 2 – In groups of three the learners complete the first two columns of a chart – identifying what the hazards are, who might be harmed, and how. They draw on their own knowledge and experience to do this.

Phase 3 – Each group presents their findings in turn and they are all merged into a single composite document. By the end of the session, they have all contributed – each group providing something different or a new slant on things and the whole class has a detailed document.

The teacher's role in this model is to set up the scenario and environment, then to guide the learners, who then take responsibility for working together and for each others' learning.

Role-play

Role-play is a model that focuses on social interaction, improving social skills and developing a personal understanding of values and behaviour. Located in Joyce's social family, the role-play model has its roots in both the social and personal dimensions of learning. The purpose of role-playing is to assist learners to understand an issue from different points of view by acting it out, either taking different roles or observing. It allows learners to look at a situation through someone else's eyes, to take a different perspective and empathise. Role-play offers an effective way of exploring feelings, attitudes, values and solving problems. It actively involves learners' and draws on their experiences.

There are nine stages in role play, as defined by Shafteel (1970): (a) warming up the group, (b) selecting participants, (c) setting the stage, (d) preparing observers, (e) enacting the role play, (f) discussing and evaluating, (g) re-enacting, (h) further discussion, and (i) sharing experiences/ generalisation. Each of these stages has a specific purpose that contributes to the richness and focus of the learning activity. According to Joyce et al (2000), role-playing provides an opportunity for 'acting out' conflicts, collecting information about social issues, learning to take on the roles of others, and improving learners' social skills. The teaching model of role-play emphasises both intellectual and emotional aspects. The analysis and discussion following the role-play are as important as the role-playing itself.

The teaching model of role-play could be found in all the occupational areas; however, the model tends to be less employed in traditional environment workshops.

The learning objective in the session used as an example below is to find out about quality assurance and the teacher uses the teaching model of role-play.

- Sequence of activities (syntax)
- *Phase 1* – The teacher uses PowerPoint slides to introduce the topic of quality assurance and the benefits of quality assurance followed by questions and answers.
- *Phase 2* – The teacher pairs the learners and gives them a card with a scenario on carrying out quality assurance of a product. The scenario requires one of the learners to be the employee and the other to be the customer. The teacher explains why the process is important and also the importance of writing things down formally. She defines what the roles are for the two people taking part in the role-play and gives clear instructions about who should be asking the questions and that feedback they provide

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should be constructive. The teacher shows another

PowerPoint slide with the rules for the quality assurance – that it should be motivational, positive and so on.

- *Phase 3* – All the learners carry out the role-play in pairs.
- *Phase 4* – The teacher gives a handout containing a quality assurance role-play checklist. There are two columns to it – one column involves questions for the employee and one for the customer. They include questions such as, ‘Did the customer check the quality of the product?’
‘Did you feel satisfied?’
‘Why?’
- *Phase 5* – The teacher asks the learners about the role-play, including how they felt about it.
- *Phase 6* – The teacher recaps on the session.
-

14.2 Teaching strategies

Strategies are the ‘tools for teaching and learning’ that teachers have available to them and

‘teaching skills’ are the ways in which teachers select and use the ‘tools’ at their disposal to achieve effective learning.

Teaching strategies are the tools that teachers have at their disposal to engage learners and enable learning objectives to be met via effective teaching and learning and teaching skills are how they select and use these strategies.

Teaching strategies are differentiated from teaching models by using our definition of a model as the sequence of steps or phases (the syntax) used to achieve particular types of learning outcomes.

The existing literature tends to divide the analysis of examples of skills and strategies observed in practice into the following three broad categories that follow the teaching and learning process. These are:

1. Planning and preparation
 - Strategies for differentiation
2. Managing delivery
 - Strategies of presentation and demonstration
 - Strategies involving technology
 - Strategies for group and individual learning
 - Strategies for reinforcing learning
 - Strategies for more effective learning
 - Using multiple strategies
3. Assessing learning
4. Strategies for assessing learning.

Planning and preparation

Duckett and Tartarkowski (2005) suggest that planning effective teaching and learning sessions should include the following processes: (a) specifying the aims and objectives or outcomes for the session, (b) showing how to review the previous session, (c) explaining the links to the current and next sessions, (d) identifying appropriate content, activities and strategies by which the learners will learn, (e) presenting strategies by which learning will be assessed, (f) selecting the resources, materials and media to support learning, and (g) considering how to summarise at the end of the session.

Differentiation is central in effective planning, ensuring that all learners can learn effectively and are sufficiently challenged. It is identified by LSIS as one of ten approaches to effective teaching and learning.

There is no single definition of differentiation, but all definitions are underpinned by a view of learners as individuals. Some approaches to differentiation suggest that differentiation needs to be considered at the planning stage of a session.

While the learning objectives and standards should remain the same, time and support given to learners by the teacher should be varied according to individual learner need. There are also the differences ways in which learners prefer to learn – visual, audio or kinaesthetic – that should be taken into account when using differentiation in the learning process. Understanding the different learning needs of individual learners, their strengths and weaknesses and how they learn best is of paramount importance to enable effective differentiation. Examples of differentiation utilised during the visits include:

- Advising and keeping learners on track by providing individual support, giving the weaker learners individual instruction and taking the stronger learners that bit further so they are not bored
- Providing the right amount of 'stretch' for individual learners while also managing the group
- E-learning activity allows for wide differentiation with, for example, board games acting as an alternative approach for learners who have not fully understood
- Using group and paired work, with careful selection of those who work together to enable different pace of learning as well as styles, 'I wouldn't generally pair a weak learner with a strong one but there are occasions when this can work with the stronger learner being a mentor and also learning more themselves through explaining to others' selection of different resources to reflect the group and individuals within the group, taking account of the learner experiences.
- Using different forms of assessment to meet the needs of the learners: for example; written, filmed or recorded.

This following example illustrates differentiation in an ICT class and seeks to include everyone in the activity at their appropriate level of ability. It describes how a teacher sets a task allowing learners to choose how they wish to complete it according to their different levels of ability.

Strategies for giving information

Presentation

Presentation encompasses giving information in a number of ways, including:

- Teacher explanation often at the start of a session – ‘this is what we are going to do, these are the objectives for the session’
- Giving information/instruction and checking that learners understand by, for instance, use of questioning
- Clearly presenting information at the start of a session and then linking to other teaching strategies – presentation followed by immediate activity
- Guest speaker input – from the relevant vocational sector
- Providing information through different sensory modes: visual, audio, kinaesthetic
- Providing information through a variety of mediums – video, board, paper, work-book, actual demonstration, verbal explanation, questions and answers and practical activity
- Short PowerPoint or other computer-based presentations for information, recapping on a previous session, setting exercises or structuring a session.

Some teachers use PowerPoint presentations as a convenient way of structuring their sessions and as an *aide memoire* to ensure that they cover everything.

Slides cover the learning objectives for the session and instructions for tasks or activities and can be printed to give to learners during or after the session.

Demonstration

Demonstration has the added dimension of an explanation by example, a display of some sort – often accompanied by verbal explanation, though not always. It is usually important to follow the demonstration with a related activity. A teacher can use a variety of technological aids.

- Demonstration examples include:
- The physical demonstration of a skill such as holding and using a blow torch, or how to decommission and reassemble a computer
- A means of showing how something is done and that the tools being used are adequate for the job.
- Demonstration of an activity, showing how to develop a planning process – for

instance, with a sample of what the end result could be like

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- Using technology such as Moodle and/or Storyboard to show what is required as well as giving information to set the scene, and use of Smart Board to demonstrate tasks such as putting a joint together in construction.
- While showing the way to do something, ensuring that learners understand that there are different ways of doing things and that if the end result is successful then that is alright.

With demonstration, impact is an important factor: the following example as described by a senior manager shows how a simple demonstration can really help the learning process.

Strategies involving technology

Educational technology is the study and practice of facilitating learning and improving performance by creating; using and managing appropriate technological processes and resources.

Use of technology in the delivery of teaching and learning for any vocational area is increasing all the time. It is also one of the ten approaches described by LSIS as effective in promoting effective learning. Examples drawn from the literature include:

- Interactive whiteboards
- Computer(s) in each learning room for various uses
- Web pages for storing and accessing learner work
- Multimedia learning
- H5P: free and open-source content collaboration framework to make it easy for everyone to create, share and reuse interactive HTML5 content: Interactive videos, interactive presentations, quizzes, interactive timelines and more. To use HTML5 ensures that can be displayed by all LMS (Learning Management Systems) platforms independly of the operative system, device and the navigator.
- Moodle (Modular Object-Oriented Dynamic Learning Environment) providing an organised interface for e-Learning, or learning over the internet
- OPIGNO: Open Source e-learning platform based on Drupal (broad used Content Management System) that allows you to manage your online trainings, and efficiently ensure that student, employee and partner skills remain up to date.
- E-Learning through applied packages and on-line learning
- M-Learning – learning on the move including use of mobile phones
- IT-based packages for self-assessment
- Computer-generated quizzes and games
- Internet research
- Podcasts
- Mobile-phone technology

- Computerised tracking.

Learning organisations are changing at different rates. Some have utilised state-of-the-art technology, which has been useful in the engagement of learners, and some are lagging behind. Funding is one issue here, along with cultural change.

The learning materials developed within ENSEC contain English, Spanish and Italian all the training materials developed during this project:

The teacher can take this Platform as supporting tool for his/her teaching activity selecting the more according for his teaching activity.

The Platform supports mobile environments and it is prepared to contain future training materilas about design of products different from the environment.

Strategies for group and individual learning

Teachers use their skills in deciding how to manage the learning process. This section includes activity-based learning using the strategies of working in pairs or with a peer, small-group work, whole-group work, and individual work. Many of the strategies described could be used within teaching models that focus on group and cooperative learning and belong to the 'social' group of teaching models. Group work and cooperative learning can shift the responsibility for learning from teacher to learner.

Pairs

Working in pairs is a valuable way of promoting good learning experiences operating along with a set of other ways of learning. Pairings can be learner-chosen, friend-orientated, random or chosen by the teacher related to abilities – both similar and diverse. For a role-playing session, the teacher picks the pairings having a good knowledge of the learners and enables effective pairings.

Pairing can be used to promote the development of communication and social skills as well as group cohesion as in this example of a plumbing session. Sometimes pairing a more able learner with a less able learner can benefit both, as can two learners that have complementary skills being paired.

Pairing can also be used to enable the development of other aspects of learning, such as attention to appropriate detail in planning. Peer explanation reinforces understanding of learning both for the recipient and the person explaining. It can really help some learners as a supplement to the teacher's information.

Peer help can also act as a role model in showing that something can be done – it provides motivation for others.

Small-group work

Splitting the whole group into smaller clusters can happen in many ways and is prevalent in vocational education. Apart from the curriculum learning aspects of group work there is also the valuable social interaction and motivation associated with working together.

Small-group activities include:

- Production of a presentation with each person playing a part

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- Putting together a piece of work, such as a questionnaire, or building something through group discussion to formulate ideas, decisions or content for pieces of work
- Groups competing against each other via quizzes, for instance, to promote learning during assessment
- Carousel activity where learners move from table to table
- Individuals coming together to complete a piece of work as a group
- Group work on a project followed by individuals then taking their version forward
- At the end of a session, reinforced learning via questions and answers.

This example illustrates the use of small-group work to make sure that everyone has all the information they need and interest and concentration is maintained.

- Role-play in small groups can be a useful learning tool to reinforce learning as explained in the example below. Role-play can also be used in a larger group with some observing and some playing their parts.

Whole-group work

Whole group activity can take many forms and includes:

- Discussion on a particular topic facilitated by the teacher, perhaps following a presentation or demonstration
- Debate carried out in formal debate mode or more informally
- Games (such as the domino illustration below)
- Whole group activity following individual, paired or small group activity to bring a topic/activity together: this might be individual research, for instance, followed by a whole-group debate activity where groups move around a space, for instance, moving to different corners of the room to answer questions or vote on a particular topic.

Carrying out a whole group activity can have advantages and disadvantages, as illustrated in the following example. Since all learners are working at more or less the same pace, it is easier to keep track of them and easier to control the group, but then some of the group may be relying on others

and it is harder to ensure that all have understood. The following example involves a game of dominos with each learner having one card carrying a word and a description of a different word. The idea is to link the dominos so that words and their descriptions are next to each other.

Individual work

Individuals carrying out learning on their own are often a part of many other ways of learning. For group learning, part of it will be a learner writing, carrying out research or reading. There might be individual work that is then swapped with another for paired work. Learners might complete an audit sheet as they carry out an individual task, such as installing software onto a computer.

Individual work can also replicate working in industry by carrying out a task alone. Learning carried out outside the classroom/workshop at home or in the library is often an individual task.

An example would be a computer-aided design (CAD) session where the learners work on their own to become familiar and expert at using CAD for drawing diagrams for construction. Although there would be some collaboration, it is essentially a solo task. Although links with employers can be a group activity, it is also something that learners can complete on their own. This enriches the learning and provides experience of working outside the classroom as well as offering an insight into how the industry works. In this example, an employer wants a web site designed and the teacher encourages the learner(s) to take the 'job' from start to finish, including the initial contact.

Strategies for reinforcing learning

Opportunities to practice-repetition

Practice and repetition help to ensure that the learning undertaken is remembered. Opportunities for this can be provided in different ways and include the examples below taken from the observations and interviews:

- Repetition of practice with regard to usage every time learners use computers
- Practice combined with questioning to memorise information about, for instance, 49 countries for an environment history unit
- Facilitating discussion to ensure that everyone understands what they are doing and how they can go back to an example to assist them if they get stuck
- Learners writing about what they have achieved to show that they understand what they have learned and recognise the importance of being thorough when, for example, writing a plan and being able to follow instructions
- The teacher checking on each learner as they progress: each time there is a repetition task, the learner should need less intervention
- Referencing back to objectives to reinforce learning
- Recapping sessions at the end of lessons to see what knowledge has been retained
- Weekly recapping to make sure of correct understanding – through Moodle, for example – by creating crossword questions, automatic marking, and an assessment grid to show individual progress.

Questioning

Effective questioning can be used to reinforce learning and includes a combination of low-level and high-order questions for deeper learning and can be used to keep learners at work and to check their understanding (Redfield and Rousseau, 1981). Examples of questioning drawn from the fieldwork visits include:

- Use at the beginning of a session and throughout to ascertain prior knowledge and links to advance organisers
- Use to check understanding and identify who is not fully engaged with the task
- Use to encourage evaluation by learners of their work and their learning, through the use of appropriate questions applied in a variety of forms; mainly open – and not just superficial but going beyond the initial response to probe deeper
- Use to check understanding by returning to a learner who may not have fully understood previously in response to questions asked: the teacher does not supply the answer, but challenges the learner to work it out – involving other learners to supply the answer if appropriate.

For questioning, it is helpful to involve all learners, not just the assertive and self-confident who want to answer the questions all the time. Sometimes learners will want not to offer an answer when they may be uncertain. One teacher solved this issue by using learners to nominate someone to answer the next question. Questioning can be used in an elimination strategy so that learners move towards the right answer.

Strategies to develop learning skills

Assisting learners to become more effective learners, to 'learn how to learn', enables them to learn knowledge and skills more efficiently – a valuable skill in itself for life. Active control over the thinking processes involved in learning is referred to as metacognition. Activities such as planning how to approach a given learning task, monitoring comprehension, and evaluating progress toward the completion of a task are metacognitive in nature. Because metacognition plays a critical role in successful learning, it is important for both learners and teachers. Metacognition is often referred to as 'thinking about thinking' and can be used to help learners to 'learn how to learn'. In some interviews, teachers explicitly described their intention to develop higher-order thinking skills.

If the culture of the organisation in which learning takes place systematically cultivates habits and attitudes that help learners to be confident of their own learning ability and to be creative, then learners are likely to learn faster, concentrate more, be more resourceful, more imaginative and more collaborative, so learning can become more enjoyable. Activities that encourage effective learning and higher-order thinking include:

- Asking questions that encourages the development of imagination
- Evaluation activities
- Researching to prepare for an assignment, particularly with peers
- Tasks in which learners need to reason and apply learning in a way that requires higher-order thinking
- Considering new information and making sense of it
- Investigative and experimental tasks
- Taking part in role-play sessions – looking at it from another person’s point of view
- Simulations to give experience of work situations
- Adopting step-by-step approaches – building one-step at a time cumulatively.

In order for learners to become more effective and develop higher-order thinking they need to be exposed to activities such as research and analysis.

Assessing learning

Assessment can be either ‘for’ or ‘of’ learning and both types of assessment are evident in the existing literature.

Assessment ‘of’ learning can take a number of forms and may depend on the curriculum design and/or delivery methods. It includes self-assessment, peer assessment and teacher assessment by using questions, paper-based or computer-generated tests, demonstrations, or games. Assessment methods are not always under the control of the teacher as they might be specified by the awarding organisation.

Assessment ‘for’ learning is recognised as an effective way of assessing that also contributes to learning. Assessment is: ‘about assessing progress and analysing and feeding back the outcomes of that assessment positively and constructively to agree actions to help the learner improve and adapt teaching methods to meet the learner’s identified needs.’ (QIA 2008). Ten principles of assessment for learning have been identified as being: (a) part of effective planning, (b) focused on how learners learn, (c) central to classroom practice, (d) a key professional skill, (e) sensitive and constructive, (f) capable of fostering motivation, (g) a promoter of understanding the goals and criteria, (h) an assistant for learners to know how to improve, (i) a developer of capacities for self-assessment (and peer assessment), and (j) a recogniser of all educational achievement (DfES 2002). It is about the teacher and the learner working together to assess progress and contribute to effective learning.

In practice, teachers tend to use a variety of methods of assessment including:

- Assessment as a learning tool – assessment for learning
- Self-assessment and teacher evaluation/feedback with assignments written on Moodle or OPIGNO, avoiding too much paperwork and automatically generating an achievement grid for learner/teacher assessment of progress, and hence feedback

- Self-assessment of understanding through the traffic-lights method
- Checklists to self-assess
- Peer feedback to provide assessment
- Workbooks
- Mock tests
- Quizzes, crosswords and games as sources of fun
- Learners being empowered to choose their own assessment format.

Different modes of testing keep the learners interested, as does the use of incentives.

Teacher reflection

Teacher reflection is a three-fold process comprising direct experience, analysis of beliefs, values or knowledge about that experience, and consideration of the options that should lead to action as a result of the analysis.

As work progressed against the framework, it became clear that there was one additional, distinctive feature that in part defined vocational learning and that was the context within which it takes place. Effective teachers are reflective; they constantly review their practice, discuss it with their colleagues, consider their learners' responses and seek to develop new and better ways of teaching. The concept of reflective practice was introduced by Donald Schon (1983) and given currency by Kolb (1984) in his experiential learning theory. It involves thoughtfully considering one's own experiences as one makes the connection between knowledge and practice, under the guidance of an experienced professional within a discipline (Schon, 1996). Moon (1999) defined reflective practice as 'a set of abilities and skills, to indicate the taking of a critical stance, an orientation to problem solving or state of mind.' In essence, it is a readiness to constantly evaluate and review one's practice in the light of new learning (which may arise from within the context of professional practice). After its introduction, many VET organisations started to incorporate reflective practice into their educational and professional development programmes. It was evident from practitioners in this study that reflection was an important and well-established part of their professional practice.

Examples are provided of reflective practice in terms of responding to learner feedback, improving practice through personal reflection and sharing with colleagues to improve practice. Teachers used a number of different ways of developing their repertoire of skills. These included: learning from experience, observation of teaching, as well as learning from the support of colleagues.

Reflective practice

There was considerable evidence from observations and interviews that good teachers are always learning, building their own skills and teaching themselves. They undertake lots of research to inform their planning and delivery. They are self-critical, recognising when things do not go well, trying to understand why, and formulating ideas about how to improve.

Teachers evaluate their practice and reflect on how they might improve aspects of their sessions. They reflect on the way that they teach something so that they do not necessarily just teach it the way they were taught but think about how it might be improved.

Responding to learner feedback

The importance of learner feedback is evident from the literature with examples of teachers sharing practice with colleagues and collecting and using learner feedback:

It is experience really and assistance from my colleagues. You need to exchange practices so you do not stagnate to the same routine. I also give feedback sheets to students. I want to see through their eyes because sometimes as teachers we think of how we want to learn or what we would like but that doesn't mean that this is what the students like. Some approaches might suit me but that doesn't mean that they suit them.

Feedback from students

It is reaction from students that is important. You can walk out of a class and think to yourself: "that was brilliant but the students didn't think it was brilliant, so it's not brilliant". The students are your judges so if students are enjoying it and they're taking part, they're keen, they're answering questions, then you can say it's reasonably successful, you've achieved what you need to achieve.

If they're not, then there's an issue and one has to think of other ways. This teacher also reflected on the session from a learner's perspective, asking questions such as: "If I was a learner in that lesson, how would I have assessed it? Would I have enjoyed it? Would I have been interested throughout?"

Teaching context

Teaching context covers a mixture of elements and includes the nature of the vocational subject, the setting where teaching and learning takes place, the objectives and desired outcomes for a session, plus specifications of the qualification, the nature of the learners, their level, and how they learn best

– including their learning styles. Context is such an important factor in vocational learning that it

warrants separate consideration. Vocational context is largely responsible for defining the nature of the learning that will take place. Consequently this new (fifth) component emerged to add to the Framework.

The literature in this area refers to context and its importance in vocational learning. In a recent publication, the Institute for Learning stated that brilliant teaching and training comes from the combination of a deep understanding of learning and the use of 'learning to learn' strategies applied within the context of a vocational subject and workplace setting (IfL, 2010). Kerka also commented on the importance of context on the effectiveness of learning, 'other key features of knowledge construction are: (a) functional context, (b) social context, and (c) usefulness. The process works most effectively when it is embedded in a context in which knowledge and skills will be used.' (Kerka, 1997). Other research findings support the value of contextualised learning that provides opportunities for knowledge acquisition and construction, practice and reinforcement, in 'natural settings', such as the workplace (Billett, 1993).

The concept of situated learning, developed by Lave and Wenger (1991), that 'knowledge is created and made meaningful by the context in which it is acquired' (Farmer et al., 1992), is deeply embedded in work-based vocational learning and in teaching models derived from constructivism. Two basic principles underlie situated learning. First, knowledge needs to be presented in an authentic context: i.e., in the setting where knowledge would usually be applied. Second, learning requires social interaction and collaboration: context is a broader concept.

In addition to the setting or location where the learning takes place, we include within this context:

- Learning objectives and desired outcomes for a session or part of a session;
- Nature of the learning such as the vocational subject area, and whether is it theoretical or practical;
- Level of the learning;
- Specification and requirements of the qualification or course;
- Nature of the learners: how they learn best, including their learning styles or any particular difficulties they might have in learning;
- Composition and size of the group of learners and the learning environment, including the resources and facilities available.

Analysis of trainers' needs

VET aims at preparing learners effectively for real workplaces, which means that the acquisition of competences should take into account the requirements of companies and industry. It is now widely accepted at a European level that VET should be competence-based. Competence-Based Education and Training should enable employees not only to increase their knowledge and skills at the workplace, but also to gain nationally accredited certificates for workplace-based learning. The self-paced and flexible structure of CBET programmes should encourage learners to become responsible for their individual learning process. The modular structure allows for individual combinations of competences limited only by certain 'packaging rules', which refer to accredited national vocational qualifications.

The purpose of nationally endorsed competence standards being at the core of CBET is on the one hand to transform the requirements of industry and enterprises into the world of learning. On the other hand, standards provide transparency of competences underlying vocational qualifications.

Competence-Based Education and Training (CBET) is an approach to VET, in which skills, knowledge and attitudes are specified in order to define, steer and help to achieve competence standards, mostly within a national qualifications framework. Deisingler, (2011,p.6) defines CBET as "a way of approaching (vocational) training that places primary emphasis on what a person can do as a result of training (the outcome), and as such represents a shift away from an emphasis on the process involved in training (the inputs). It is concerned with training to industry specific standards rather than an individual's achievement relative to others in the group". Six criteria are currently used to describe the typical structure of CBET programmes. These criteria specify both the micro-structure of CBET (i.e., its learning and assessment

Report: 102-Trainig path, learning content structure and guidelines for lecturers dimension), and the macro-structure (i.e., its institutional framework).

**Outcome
criterion**

Persons demonstrating all prescribed competences in an accredited course or training programme should obtain a credential or statement of attainment that is recognised within the national framework. Reports of competences gained should be provided to learners. Reporting may be in terms of completed modules provided that the relationship between competences and modules is understood. The course is recognised to meet national competence standards that have been endorsed by a national authority. In the absence of national standards, course outcomes should be based on the authority's definition of competence and endorsed by industry training boards or by relevant industry parties where industry training board coverage is not appropriate.

**Curricular
criterion**

The curriculum gives learners a clear indication of what is expected of them in terms of performance, conditions and standards. Also, if appropriate, subsequent workplace and off-the-job training and assessment responsibilities should be identified.

**Delivery
criterion**

Delivery is flexible and learners can exercise initiative in the learning process. Learning materials used by providers indicate the degree to which programme delivery is learner-centred.

**Assessment
criterion**

Assessment should:

- Measure performance demonstrated against a specified competence standard;
- Be available for competences gained outside the course;
- Include workplace or off-the-job components if appropriate.

**Reporting / recording
criterion**

Reports of competences gained should be provided to learners. Reporting may be in terms of completed modules provided that the relationship between competences and modules is understood.

**Certification
criterion**

Persons demonstrating all prescribed competences in an accredited course or training programme should obtain a credential or statement of attainment that is recognised within the national framework.

14.3 Methods and tools for the delivery of the content through the ENSEC Platform

A literature review conducted informs the delivery of the Master's content, revealing the

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following:

1. Teaching and learning is a highly complex process and effective practice results from a complex interaction of factors.
2. There is little evidence that vocational teaching and learning is fundamentally different from any other type of teaching and learning except in one respect – that of context. Given the importance of context, a new Framework was developed from that of Hopkins (2007), to include 'context' as a separate, specific component. These five interrelated and overlapping components in the Framework must work in synergy to provide effective teaching and learning that meets the required learning objectives and learning outcomes.
3. There are many examples of effective practice in vocational teaching and learning.
4. Teachers believe that in many cases, practice is directly transferable from one vocational area to another.
5. Teachers indicate that they also vary their practice, for example, in response to the different levels of the programmes and abilities of learners.
6. Vocational teaching and learning is underpinned by some learning theories – experiential learning and learning styles theories being the most prevalent.
7. Teachers draw extensively on their own experiences and those shared with colleagues.
8. Teaching relationships were identified as crucially important.
9. Teaching models did not appear to be used intentionally in a planned and systematic way by teachers when deciding how to teach.
10. Teachers use their skills to choose from a very wide range of strategies. These include strategies for: differentiation, presentation and demonstration, using technology, group and individual learning, reinforcing learning and assessing learning as well as the use of multiple strategies within a session.
11. In the very best sessions, teachers tend to have high aspirations and seek to stretch their learners. They plan to develop a range of learners' skills beyond just mastering a particular skill or acquiring information to meet a course or qualification specification. These skills include higher-order learning and thinking skills (such as 'advance organisers' and learning to learn), social and interpersonal skills to communicate effectively and employability skills. These are consistent with the skills for the 21st century.
12. Effective teachers are reflective; they constantly review their practice, discuss it with their colleagues and seek to develop new and better ways of teaching.

In the context of training-material provision for a Massive Online Open Course (MOOC) framework, the following pages supply an outline for a core philosophy in the delivery of content. A MOOC could and should be much more than a traditional course delivered online. Packing face-to-face classes to an online system does not make sense from a pedagogical perspective.

A long tradition and successful experience coming both from the educational technology and distance- learning fields should be taken seriously and as a source of inspiration. Considering the diverse learning modes, ranging from face-to-face to fully online, (Guàrdia, 2012; Bach, Haynes, & Smith, 2007; Bates & Poole, 2003), it is possible to conclude that there is a considerable number of identifiable

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online delivery models in education, and that MOOCs are just one more possibility in the application of ICT. It is also possible to situate MOOCs at the far right end of the online learning continuum.

Aligned with the continuum classification, Hill (2012, p. 86) contextualizes MOOCs within a “landscape of educational delivery models” considering the role of the educational technology and instructional design. Researchers and experts in this field are discussing the best pedagogical approach to MOOCs. The text below tries to address some key questions regarding the value of MOOC’s beyond a massive and open delivery.

The previous MOOC distinction is somewhat forced to trigger the inherent differences. In fact, as Lane (2012) remarks, a MOOC usually manifests tendencies that put an accent on the network, the content, or the tasks. In all cases, massiveness and low-teaching involvement during delivery stages is one the biggest challenges for a MOOC.

Here are ten key elements that should be taken into account by those involved in teaching a MOOC.

1. Competence-Based Design Approach. CBDA focuses on outcomes of learning and addresses what the learners are expected to do rather than what they are expected to learn about (Richards & Rodgers, 2001). Learners need to learn in ways that can develop their capacity to solve situations that are commonly encountered in everyday life. This is best achieved by including contextual variation, situating learning as part of the learning experience, through Simulations, Problem-based learning, Case-based learning, and Project-based learning. Through this kind of activities, learners should develop the competences better than by passively reading a large amount of text-based documents or watching and listening to traditional video lectures and testing comprehension.
2. Learner Empowerment. Online learners’ attention is much more demanding, and what works for campus teaching does not (usually) replicate in networked spaces. Regressive pedagogy (Siemens, 2013) is abundant in MOOCs that emphasises a teacher-centred approach difficult to transpose into online learning environments. Recorded long-lasting master classes underestimate the potential of technologies and inhibit interaction. The video technology could be used for broadening communication opportunities and for encouraging learners’ expression. MOOC design should privilege a Learner-Centred Approach, providing strategies that change the perception of learners as active participants in the establishment of individual goals and a personal trajectory. Self- regulation, self-pacing, and self-assessment together with peer support and the formation of interest groups promote student empowerment and engagement.
3. Learning plan and clear orientations. Planning is crucial in a MOOC. As the heterogeneity of students is high, their level of maturity and experience is also varied. At the beginning, it is good practice to give the learners a study plan accompanied with detailed templates for the developing of activities. Clarify milestones and compulsory activities, providing a well-developed schedule with tasks, assignments and deadlines. Use a friendly tool easy to integrate with the student digital agenda that provides a suggested pace for learning, with a detailed description of tasks and subtasks and their estimated time. Suggest clues

on how to cope with incidentals and plan for contingency (peer assistance, revision of personal goals and expectations, revision of personal planning and agenda). Do not forget to add criteria for assessment and avoid relying exclusively on multiple-choice tests.

4. Collaborative learning. Design for collaborative learning including teamwork activities and discussion forums. Allow the addition of exchange spaces for and by students. Provide clear 'netiquettes' for participation in discussion forums or any other collaborative activity. Establish rules and parameters about quality and extension of course production and interventions. Foster this collaborative approach by designing and promoting activities and tasks in which collaboration is a must or an added value.
5. Social networking. Social aspects should not be neglected. They are at the source of group formation and the establishment of durable peer cooperation. Set up a space to foster social interaction and frequent contact between the learners. To promote a 'feed forward' attitude of sharing the work with other learners, and facilitate exchange, create a course hashtag for social applications like Twitter, and social bookmarking like Diigo. Provide guidance on social and open tools and strategies that help learners to create their own personal learning environment (PLE), with content aggregators, mashups, personal blogs, and learning communities to keep a permanent connection with the network.
6. Peer assistance. The notion of 'paragogy' relates to peer production environments (Corneli & Danoff, 2011), including the co-creation of ad-hoc spaces for dialogue and support. The MOOC design should make explicitly mention the value of peer assistance through commenting and social appraisal. It should provide guidance on 'how much' the student should read contributions by others and explain a strategy for filtering course-generated information both individually and automatically. Even hints on how to present better the generated information to others by using – for example – descriptive titles that help the other participants to decide if they want to read it. These can be exemplified by learners as useful tips.
7. Quality criteria for knowledge creation and generation. The notion of Learner Generated Content (Perez-Mateo, Maina, Guitert, & Romero, 2011) is associated with learner outputs in Web 2.0 and networked environments. Establish in a MOOC the value of informed but personal views on topics and how they contribute to knowledge construction. Show how original content is appreciated, providing quality criteria for content development and content selection. Differentiate 'brainstorming' and 'exploratory' tasks from final activities. Promote critical thinking giving value to the creation of good questions and not only to finding answers.
8. Interest groups. Provide opportunities for small-group discussion and exchange.
Recommend small-group focused discussions. Give hints on how better to organise groups and subgroups according to their interest. The 'crowd' participation in a MOOC enables the formation of sub-networks based on interests, culture, geography, language, or some other attribute that draws individuals together (Siemens, 2013). Once a group or subgroup is formed, each member should be

- Report:** 102-*Trainig path, learning content structure and guidelines for lecturers* assigned a role. To assist group creation and cohesion, establish a social learning environment and promote 'extended' presentations. This could keep motivation alive and avoid learners losing interest before dropping out.
9. Assessment and peer feedback. Building trust in self- and peer-assessment can be addressed by elaborating objective and precise criteria and explanation. The design of rubrics, scales, and explanatory automatic answers are supportive tools for the learner. Furthermore, give clues on how to collect learning evidence and organize them to provide accountability of learning trajectories. Suggest the use of a blog or e-Portfolio applications for collecting, reflecting, annotating and sharing the learning outcomes and further reflections.
 10. Media-technology-enhanced learning. Making appropriate use of media is the result of informed decisions on technology (Laurillard, 2002). Offer learners a variety of rich-media for capturing their attention and retention. On the other hand, in order to improve the quality of production by learners and to support engagement, provide guidance on how to determine best media choices according to each intention. Confront them to the abundance of applications and encourage the exploration of new available tools that support rich interactive and highly audio-visual content.

At present, most MOOC discourse reflects strategic, institutional, economic, social and technological concerns. A deep pedagogical debate is still missing. These ten points introduce a set of design principles drawn from the perspective of the learner.

According to existing literature, MOOC participants put forward in their reflections and comments thoughtful accounts of their learning experience and useful recommendations for improvement that comprise strong pedagogical considerations, such as:

Empower learners with networked learning strategies that foster critical thinking and collaboration. This requires putting the learner at the centre of the process while providing adequate learning contexts, methods and tools that enable the development of targeted and self-traced competences. It includes scaffolding regulatory evidence on outcomes by well-developed assessment strategies combined with criteria-based rubrics for self- and peer-evaluation.

Ensure teacher presence (Anderson, 2008) not only as a referent or expert in the field, but through the course design. Teacher-mediated presence should be tangible through a detailed study guide, a set of meaningful learning activities, a collection of interactive resources, and supplementary recommendations on how to organise the social interaction. The learning scenario should be deployed to include descriptive learning tactics on how to navigate, organise, and participate in a new global learning scenario.

15 Ensure open licenses OER for training materials

The results of the ENSEC project will be uploaded onto the project website where the different teaching and learning materials will be available to download. This section of the website will be open- accessed and teachers and learners will have free access to download tutorials, good practices

manuals, etc. The consortium has decided that the full access to the materials will need a previous login. EVM will manage the user administration to give future permissions.

Each of these digital materials will be open licensed and so will avoid the automatically applied copyright restrictions. The aim to open-licence the work and results of the project is also to spread the reach and recognition of the authors. From the organisations perspective, the resources are potentially exploitable for obtaining commercial benefits and thus the partners will have all-rights reserved as copyright. The organisations and the authors will be able to market these resources in the future, ensuring that it remains attributed to the original author after the content has been shared. This does not mean that the partnership will actively market the resources, it will mean that the intellectual property rights (IPR) of the partners and authors are protected.

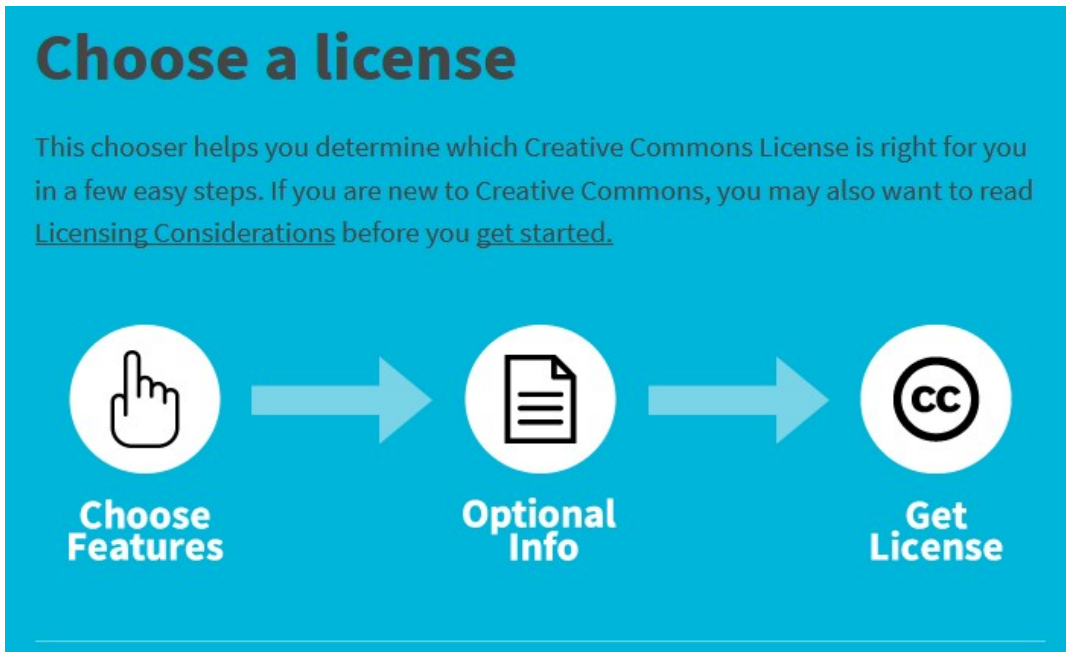
By sharing of the digitalised materials between students and the institutions under this licence, the content will remain attributed to the original author. The intention of others to plagiarise the source materials will be reduced because they will have permission to use them under open source licence. ICTs will be essential for sharing the educational materials. Within the e-learning platform (IO3) a separate section for uploading the contents will be defined. In this open-access section teachers and learners will be able to download resources such as:

- Text: Teaching tutorials, best practices tutorials, modules content, templates, exercises, etc
- Images: Logos, photographs, diagrams, etc
- Video: Video Tutorials, animations, etc
- Audio: Audio-Tutorials, music, etc

All of these contents will have the most used multimedia formats like: DOC, TXT, PDF, HTML (for text); PNG, JPG, PDF (for images); WAV and MP3 (for audio); AVI, MP4, MPG (for video). Using these formats will make access simpler for users. This will include consideration of accessibility issues to ensure no users are discriminated against. In order to achieve the best practice for accessibility we will follow European legislation. **The selected alternative licensing has been Creative Commons (CC)¹**. These licenses have the aim of sharing and reusing the created work under some special conditions. The author authorises the use of their work, but it is protected and authorship is recognised. For every material this type of the CC license will be chosen. The options for the CC are:

- 1-Allow adaptations of your work to be shared: A-Yes
B-No
C-Yes, as long as others share alike
- 2-Allow commercial uses of your work: A-Yes
B-No

¹ <https://creativecommons.org>



Taking into account all these possibilities, the author will be able to choose between 6 types of licences, depending on the needs of the organisation, the kind of material, etc. The best way of ensuring that the author will be remunerated is **excluding commercial uses and adaptations**. This is "Attribution Non-Commercial No Derivatives". The author has the right of the exploitation of their work whenever they are considered. Also, the authors will be able to exploit it with a different kind of license (CC or other) or even to retract it (but the original CC license will still be valid).



Figure. Icon for the select CC selected license

The training materials were protected under Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International. The user is free to:

- **Share** — copy and redistribute the material in any medium or format
- **Adapt** — remix, transform, and build upon the material

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- **NonCommercial** — You may not use the material for commercial purposes.
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The consortium has used their know-how and expertise in the field of environment design and applied arts to develop the training materials. Nevertheless, reference to other sources (text, images, etc) have been used to develop ARTURE course. The consortium has agreed to use Harvard Referencing Bibliography² to reference those sources.

² <http://www.citethisforme.com/harvard-referencing>

16 References

- Anderson, T., (2008). *The theory and practice on online learning* (2nd ed.). Issues in Distance Education Series (electronic version). Athabasca University, Canada: AU Press
- Bach, S. & Haynes, P. & Smith, J. L., (2007). *Online learning and teaching in Higher Education*. London: McGraw- Hill
- Ballantine J. and McCourt Larres P. (2007). 'Cooperative Learning: A Pedagogy to Improve Students' Generic Skills?', *Education and Training*. Vol. 49, Iss. 2, pp.126–137.
- Bates, A. W. & Poole G., (2003). *Effective teaching with technology in Higher Education: Foundations for success*. San Francisco: Jossey-Bass.
- Billett S. (1993). 'What's in a Setting? Learning in the Workplace', *Australian Journal of Adult and Community Education*. No. 1 (April 1993) pp 4–14.(EJ 464 971).
- Creemers B. P. M. (1994). *The Effective Classroom*. London: Cassell
- Colley H., James D., Tedder M. and Diment K. (2003). 'Learning as Becoming in Vocational Education and Training: Class, Gender and the Role of Vocational Habitus', *Journal of Vocational Education and Training*. Vol. 55, Part 4, pp.471–498.
- Deissinger, Th. (1996). Germany's Vocational Training Act: Its Function as an Instrument of Quality Control within a Tradition-based Vocational Training System, in: *Oxford Review of Education*, vol. 22, pp. 317–336.
- Deissinger, Th. (2004). 'Apprenticeship Systems in England and Germany: decline and survival', in: Greinert, W. - D. / Hanf, G. (eds.), *Towards a History of Vocational Education and Training (VET) in Europe in a Comparative Perspective*. Proceedings of the First International Conference, October 2002, Florence, Vol. I (CEDEFOP Panorama Series, No. 103), Luxembourg (Office for Official Publications of the European Communities), pp. 28–45.
- DfE (2010). *Participation in Education and Training of 16–18 year olds by Highest Qualification Aim and Institution Type, and Work-based Learning*, England, 1985 Onwards. <http://www.education.gov.uk/rsgateway/DB/SFR/s000938/sfr18-2010ratesv2.xls>
- DfES (2002). *Assessment for Learning: 10 Principles*. National Strategies Assessment Reform Group
- DfES (2004). 'Pedagogy and Practice: Teaching and Learning in Secondary Schools Unit 2'; *Teaching Models*. http://webarchive.nationalarchives.gov.uk/20100612050234/http://nationalstrategies.standards.dcsf.gov.uk/node/95448?uc=force_uj (accessed 23.07.17)
- Duckett I. and Tatarkowski M. (2005). *Practical Strategies for Learning and Teaching on Vocational Programmes*. Vocational Learning Support Programme 16–19. London: Learning and Skills Development Agency.
- Ertl, H. (2000). *Modularisation of Vocational Education in Europe. NVQs and GNVQs as a model for the reform of initial training provisions in Germany?*, Oxford (Symposium Books).
- European Commission (1995). *White Paper on Education and Training: Teaching and Learning – Towards the Learning Society* (November 1995), Brussels (European Commission).
- Farmer J., Buckmaster A. and Legrand Brandt. (1992). 'Cognitive Apprenticeship.' *New Direction in Adult and Continuing Education*. No. 55 (Fall 1992) pp. 41–49. (EJ 456 732).
- Field S., Hoeckel K., Kis V. and Małgorzata K. (2009). *Learning for Jobs: OECD Reviews of Vocational Education and Training Initial Report*. www.oecd.org/dataoecd/36/24/43926141.pdf
- Gonczi, A., Hager, P., Oliver, L. (1990). *Establishing Competency-Based Standards in the Professions*,

Report: 102-*Trainig path, learning content structure and guidelines for lecturers*
Canberra

Guàrdia, L., (2012). 'El diseño tecnopedagógico del ePortfolio para contextos de enseñanza y aprendizaje en la educación superior: desde una visión evolutiva de los modelos de educación a distancia a la educación en línea'. [Higher Education ePortfolio design: an evolutionary visión from ODL to online learning]. (Unpublished doctoral dissertation). Euskal Herriko Unibertsitatea, San Sebastián.

- Guthrie H., Harris R., Simons M. and Karmel T. (2009). 'Teaching for Technical and Vocational Education and Training (TVET)'. *International Handbook of Research on Lecturers and Teaching*. Vol. 21, Iss.10, pp. 851–863.
- Hattie J. A. C. (2009). *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*. London: Routledge
- Hill, P., (2012). *Online educational delivery models: A descriptive view*. *Educase Review*, 6, 85-97.
- Hopkins D. (2007). *Every School a Great School*. Maidenhead: McGraw Hill/Open University Press.
- Institute for Learning (2010). *Brilliant Teaching and Training in FE and Skills: A Guide to Effective CPD for Teachers, Trainers and Leaders*.
http://www.ifl.ac.uk/__data/assets/pdf_file/0011/16400/IfL2010-BrilliantTeachingAndTrainingGuide.pdf (accessed 18.07.17)
- Ji-Ping Z. and Collis B. (1995). 'A Comparison of Teaching Models in the West and in China'. *Journal of Instructional Science and Technology*. Vol. 1, No. 1, Article 3.
<http://www.ascilite.org.au/ajet/e-jist/docs/vol1no1/article3.htm> (accessed 19.06.17)
- Joyce B., Weil M. and Calhoun E. (2000). *Models of Teaching* (6th edn.). Needham Heights, MA: Allyn & Bacon.
- Kerka S. (1997). *Constructivism, Workplace Learning and Vocational Education*. ERIC Digest No. 181
- Kolb D. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. London: Kogan Page.
- Lane, L., (2012, August 15). 'Three Kinds of MOOCs'. Retrieved from:
<http://lisahistory.net/wordpress/2012/08/three-kinds-ofmoocs/>
- LSN (2006). 'Learning Styles for Vocational Teaching and Learning'. LSIS Excellence Gateway. <http://www.excellencegateway.org.uk/VLSP-13112>
- Marzano R. J. (1998). *A Theory-based Meta-analysis of Research on Instruction*. Aurora, CO: Mid-continent Research for Education and Learning.
www.mcrel.org/pdf/instruction/5982rr_instructionmeta_analysis.pdf
- Moon J. (1999). *Learning Journals: A Handbook for Academics, Students and Professional Development*. London: Kogan Page.
- Ofsted (2009). *Common Inspection Framework for Further Education and Skills 2009*. Manchester: Ofsted.
- QIA (2008). 'Guidance for Assessment and Learning'.
http://sflip.excellencegateway.org.uk/pdf/4.2sflguidance_5.pdf
- Petty G. (2009). *Evidence-Based Teaching: A Practical Approach*. (2nd edn.). Cheltenham: Nelson Thornes Ltd
- Rauner F. and Maclean R. (2008). *Handbook of Technical and Vocational Education and Training Research*. Dordrecht: Springer.
- Siemens, G., (2012, July 25). 'MOOCs are really a platform'. eLearnSpace. Retrieved from:
<http://www.elearnspace.org/blog/2012/07/25/moocs-are-really-a-platform/>
- Slavin R. E. (1995). *Cooperative Learning: Theory, Research and Practice*. (2nd edn.). Boston: Allyn & Bacon.
- Smith R. M. (1982). *Learning How to Learn: Applied Theory for Adults*. Chicago: Follet.
- Smith, E., Keating, J. (2003). *From Training Reform to Training Packages*, Tuggerah NSW (Social Science Press).
- Teaching and Learning Research Programme and Economic and Social Research Council (2006). *Improving*

Report: 102-*Trainig path, learning content structure and guidelines for lecturers Teaching and Learning in Schools*. London: Institute of Education.

O2/A2 DEFINITION OF LEARNING CONTENT MODULES

JOSÉ LUIS GARCÍA RODRÍGUEZ

MARTÍN CRUZ GIMÉNEZ

CLARA CORDÓN TRUJILLO

Universidad Politécnica de Madrid

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1 Programme Specification

This Programme Specification is correct as of the date given below; however, minor amendments may be made throughout the year and will be incorporated in the annual updating process.

1.1 **Courseing Institution:**

Buckinghamshire New University

1.2 **Teaching Institution:**

Buckinghamshire New University

1.3 **Faculty:**

Institute for Conservation, Sustainability and Innovation

1.4 **Department:**

Forest Engineering

1.5 **Final Course:**

Course of Science

1.6 **Programme Title:**

Environmental security - ENSEC

1.7 **Accredited by:**

Spanish National Accreditation Agency

1.8 **Length / Mode / Regime:**

1 year/ PT

1.9 **Language of Study:**

English

1.10 **Date of Production/Revision:**

To be confirmed

1.11 **Potential Student Profile / Criteria for Admission:**

The University welcomes applicants with non-standard or no formal qualifications and applicants will be assessed through a recruitment process based on interview, portfolio or other evidence of achievement and ability to benefit from the course.

The standard entry requirements will be an undergraduate degree at second class honour or above from a relevant studies discipline. The course is keen to recruit those working in community or private companies' provision and will consider all applicants from non-standard backgrounds.

This course's degree programme sets a new standard in offering higher education opportunities for students working in the public, private and voluntary sectors. Developed with experts from environmental security Agencies and technology supply industries, the programme has been created to utilize the University/s flexible and distributed learning package. This maximises the time spent on relating the issues in the programme to the workplace and minimises time away from work.

Who this programme is aimed at:

- Employees who are currently working in, or have the potential to work in a role where they have responsibilities for designing and supporting environmental security programmes for participants who may wish to gain a high level academic Course in this important and emerging area.
- Individuals who have experience in the management of Environmental security.
- Mature applicants who have been out of the education system for some time and who wish to focus on developing a career about environmental security programmes in the community.
- People capable of study at Courses Level.

Entry criteria

Students have to have the ability to study and produce work expected at Courses Level, as well as have sufficient real experience in order to relate their learning experience to their work experience. For these reasons, the entry criteria have to be flexible, realistic and recognise a range of previous qualifications and experience.

All potential students should have current experience in the field of environmental security, with a recommended minimum of one year. All potential students should have a qualification at HE level, to demonstrate the ability to study in the academic environment. This requirement may be waived if the candidate had exceptional experience in environmental security and University staff believed the candidate would be successful on the programme.

While the Faculty seeks flexibility in entry requirements to this programme, it is unlikely that applications would be accepted from anyone with no previous experience or suitable academic qualification in environmental security.

Why students should choose this Course:

To -

- Gain a qualification at Courses Level that is relevant to their professional development.
- Build on previous qualifications and experience in order to gain professional recognition in this field.
- Develop lifelong learning skills.
- Apply academic theory and principles in environmental security environment.
- Minimise disruption to work patterns.

- Undertake assessments based around their own workplace activities.

Opportunities available after completion of the Course:

- Enhanced employability in the area of environmental security
- Membership of a Register for Exercise Professionals and similar professional bodies.

Essential skills are built into the programme to enable students to learn and to demonstrate learning and these will be supported by the Skills Support Staff, Personal Tutors and the Virtual Learning Environment.

The Course is structured in three stages so that students can gain accreditation at Post Graduate Certificate level following the successful completion of modules... and Post Graduate Diploma level on the additional successful completion of module... and exit at these points if they wish.

1.12 Main Educational Aims of the Programme:

The main educational aims of the Course in Environmental security are to:

- To facilitate independent and self-directed learning and reflective practice in the field of environmental security
- To develop professional skills specific to the field of environmental security
- To identify and evaluate practical applications in the field of environmental security
- To develop research skills to support the continued development of environment sustainability as a discipline
- To exchange ideas and explore the significance of values with other relevant professions in order to develop greater understanding and communication between associated disciplines and cultures.

2 Programme Structures and Requirements

Course Title:	ENSEC				
Mode:					
Course Code:					
Total Credits available: 180	Total European Credit Transfer System credits Courseed for Course: 90				
Module Title	Assessment Regime (%)				
	ETCS	Test Grid	Assignments	Case Studies	Examinatio
Introduction to Environmental Security	6	25	25	25	25

Forest Fire Land Restoration	6	25	25	25	25
Polluted Soil Restoration	6	25	25	25	25
GIS and Environmental Management/Security	6	25	25	25	25
Climate Change and Waste Land Restoration	6	25	25	25	25
Climate Change Mitigation and Adaptation Systems	6	25	25	25	25
International Climate Change Governance	6	25	25	25	25
Forests, Poverty and Environmental Security	6	25	25	25	25
Research Methods	6	25	25	25	25
Introduction to Soft Skills	6	-	50	25	25
Training	30	-	-	-	100
Thesis Dissertation	30	-	-	-	100

3 Programme Outcomes

The outcomes for this Course in Environmental security are:

- To engage in reflective practice in the field of the Environmental security.

- To develop competence in environmental security
- To design, implement and evaluate practical applications in environmental security.
- To produce an extended research project in the field of environmental security.
- To ideas and explore the significance of values with other relevant professions in order to develop greater understanding and communication between associated disciplines and cultures.

4 Learning, Teaching and Assessment Methods to Achieve the Learning Outcomes

The programme comprises ten modules. All of them are designed to provide significant opportunities to apply current theories, concepts and practices to environmental security programmes. The vocational relevance of knowledge, skills and assessment are important factors in the teaching and learning methods of this Course's degree. Wherever possible, the links between academic theory and 'real' outcomes for the individual will be examined and emphasised. Students will be encouraged to use their individual workplace experiences to enhance the learning experience. This will particularly be the case during the workshops.

The teaching and learning strategy will encompass a diverse range of teaching and learning methods with support material and communication available through the VLE. The delivery of the modules will encourage an investigative approach and students will be expected to consider how theories, principles and concepts impact upon learning and application in the workplace.

Relevant individual tutorials, discussion groups, group tutorials, practical laboratory and gym workshops, live data, and direct consultation with industry through guest speakers will inform students and may prove to be useful in generating avenues of discovery and investigation. The programme will include scenario exercises which will require informed and applied decision-making.

Students will use a range of established techniques to initiate and undertake analysis of information and to propose solutions to individual case studies. They will be encouraged to communicate information effectively to specialists and non-specialists, and to articulate decisions and information in a variety of forms.

Students will have the opportunity to further develop essential skills that are explicitly assessed on the programme.

The essential skills needed during this programme are those that will enable a student to learn and to demonstrate learning through the application of theories and principles of environmental security.

The overall aim is to use innovative teaching, learning and assessment methods to guide students towards becoming confident and competent in the provision of solutions for a range of environmental security scenarios.

4.1 Assessment Strategy

In line with the innovative nature of this Course, the supporting assessment strategy uses a blend of assessment methods. Evidence of the achievement of the learning outcomes will be in the form of:

- Written and practical assignments
- Participation in discussions and scenario exercises
- The production of a portfolio of case studies
- Examination
- A dissertation of around 20,000 words (with 10% tolerance).

Both formative and summative assessment methods will be used throughout this programme. Formative assessment creates a point for both students and tutors from which to appraise development, consolidate learning and to plan ahead.

Summative assessment allows recognition for progression to further study, informs those involved of the level of achievement, and validates the learning process.

Students will be expected to apply theoretical understanding in a variety of different scenarios and employ a range of approaches to expression and articulation in assignments.

At the end of this programme students will have developed the knowledge and skills needed for enhanced employability opportunities in the area of environmental security.

5 Matrix Mapping

This section shows how the individual modules (with module learning outcomes as described in each module descriptor) together contribute to the programme learning outcomes. This relationship is shown in matrix form.

The template includes a draft of a matrix which presents constituent modules as rows, and the programme learning outcomes as columns. Programme teams will edit this matrix to represent the specifics of the particular programme.

Programme Outcomes to Individual Modules

Programme Learning

Core Modules by Level

Outcomes

Level

Level

Level

Note: where particular pathways are required for achievement of Learning Outcomes these should be included.

6 Work Based Learning / Placements

Where applicable, add on as an Appendix to the Programme Specification.

7 Special Features

The following areas are covered by the approved University procedures as detailed on the University's web site:

- Assessment Regulations
- Annual Review and Evaluation
- Student Feedback
- Personal Tutoring
- Student Representation

8 University Employability Audit

8.1 Definition of Employability

"A set of achievements, understandings and personal attributes that make individuals more likely to move successfully into and within the labour markets, to realise their potential and to

operate self-sufficiently to achieve sustainable employment" (Adapted from Employability definitions in HEA publications in the Employability series One & Two)

8.1.1 Faculty and School...

8.1.2 Course being audited: Course in environmental security

8.1.3 Audit undertaken by: ... Date: ...

8.1.4 Dean name: ... Date:...

8.2 **Graduate employment:**

Audit point has not been seriously considered at all (0), very limited evidence (1), partial evidence (2), satisfactory evidence (3), substantial evidence (4)

SCORE

- Does academic staff know who actually employs your graduates?
- Has graduate employment destination data been circulated to academic staff within the last 2 years?
- Do current students know who employs graduates from this course? New Course. (This information is not available at this time)
- Do recent graduates visit to talk about their current jobs? (It is envisaged a few full-time students may return to address students after they complete the course.)
- Are students made aware of where they can obtain information on graduate destinations in employment?
- Are students aware at an early stage of the employment opportunities open to them?

8.3 **Career-path development:**

Audit point has not been seriously considered at all (0), very limited evidence (1), partial evidence (2), Score satisfactory evidence (3), substantial evidence (4)

SCORE

- Are guest/visiting lecturers encouraged to reveal their own career paths?
- Are graduate career profiles available to students? (At this time, only Undergraduate profiles are available)
- Do recent graduates visit to talk about their career paths? New course. (It is envisaged a few full-time students may return to address students after they complete the course.)
- Do more senior graduates visit to talk about their career paths? New Course. (It is envisaged a few full-time students may return to address students after they complete the course.)

8.4 Career Management Skills:

Audit point has not been seriously considered at all (0), very limited evidence (1), partial evidence (2), satisfactory evidence (3), substantial evidence (4)

SCORE

- Are students explicitly taught career management skills?
- Do students critically engage with theories of career development and self - assessment? Do students identify and analyse personal skills necessary for success in future career or course choice?
- Do students construct a graduate level CV relevant to one of the following: appropriate level opportunities in an industry related to their area of study; a specified graduate training scheme; post graduate study? (It is envisaged most students will already be in employment).
- Do students critically and effectively examine current labour market trends in a vocational area relevant to study or career aspiration?
- Do students determine the range of options available to themselves through personal research?
- Do students market themselves effectively to employers/training providers? (**This has yet to be determined with the first intake of students**)

8.5 Relationships with employers:

Audit point has not been seriously considered at all (0), very limited evidence (1), partial evidence (2), satisfactory evidence (3), substantial evidence (4)

SCORE

- Have you made potential employers aware of the skills your students develop?
- Is your institution/course on the list of favoured institutions with relevant employers? **Institution yes** Do you know what employers perceive to be the strengths and weaknesses of your students? Do students have the opportunity to visit local employers? Do you have good communication with employers of your graduates?
- Do employers visit your course/curriculum area to give talks about employment opportunities?
- Do employers attend any student final year project presentations? **This is the intention**
- Do you know what skills, knowledge and attitudes your employers see as becoming more important in the next 4 years?

8.6 Options for work experience:

Audit point has not been seriously considered at all (0), very limited evidence (1), partial evidence (2), satisfactory evidence (3), substantial evidence (4)

SCORE

- Are work experience opportunities provided/encouraged during vacations?
- Are sandwich placements provided/encouraged as part of the course?
- Are overseas placements/study experiences possible and encouraged for students?
- Are realistic simulations used to give experience of real work situations? Do students carry out course project work in real settings with employers?
- Are work placements available in areas not involving your specific discipline?
- What proportion of students on your course has obtained work experience before graduation?

(0 = don't know; 1 = <5%; 2 = 5-20%; 3 =20-50%; 4 =>50%)

New Course

- Are students on work placements supported by a process which encourages reflection and emphasizes breadth of learning opportunities?

No work placements

8.7 Does your curriculum promote employability?

Audit point has not been seriously considered at all (0), very limited evidence (1), partial evidence (2), satisfactory evidence (3), substantial evidence (4)

SCORE

- Is academic staff aware of what employers are looking for in graduates?
- Do employers review your curriculum and provide feedback on its content?
- Are generic skills (e.g. communication, group working, IT) explicitly taught?
- Are generic skills assessed? **As part of assessment regime**
- Do students complete a skills matrix? **New Course - can be introduced**
- Are subject-specific skills taught and practiced?
- Are subject-specific skills assessed?
- Does academic staff identify students who are not numerate?
- Does academic staff assess students' ability to write clear, concise, correct English?
- Are key skills and employability issues in the relevant QAA benchmarking statement incorporated in your curriculum?
- Are students given a choice of modules or choice of work areas within a module so they can tailor the content of their course to their perceived needs/interests?
- Are appropriate professional attitudes developed and discussed with students?
- Have work related learning activities taken place in the course and are these made explicit to students? **New Course**
- Have opportunities to increase work related learning in the course been identified and taken?
- Are all students given a basic grounding in ethics within the discipline field?

8.8 Extra-curricular activity:

Audit point has not been seriously considered at all (0), very limited evidence (1), partial evidence (2), satisfactory evidence (3), substantial evidence (4)

SCORE

- Is the contribution of extra-curricular activity to CV and skills development explained to students early in the course?
- Are extra-curricular activities and responsibilities recorded by your students? Are extra-curricular activities known to staff (e.g. personal tutors)?
- Are arrangements in place to encourage voluntary work by students? **Most of these students will already be employed**
- Are students made aware of and encouraged to enrol on the optional Module? **They will be**
- Are students made aware of and encouraged to participate in the Enterprise Week activities? **(where available) They will be...**

8.9 General:

Audit point has not been seriously considered at all (0), very limited evidence (1), partial evidence (2), satisfactory evidence (3), substantial evidence (4)

SCORE

- Is there an effective relationship between the course team and your Careers & Employment Service? (Where available)
- Are students explicitly guided in the course to make contact with the Careers & Employment Service?
- Are students encouraged to have confidence and high aspirations?
- Do staff generally have access to full information about a student's in course and extra-curricular performance (e.g. student's CV) when writing references?

8.10 Follow up to Audit:

8.10.1 Course Team Action Planning

Please make a list of priority actions arising from this audit and any resources that may be needed to facilitate change by using the Action Plan template as follows.

Employability Audit: Action Plan

Year:

Activity	Resources Required	Lead Responsibility
Timescale	(if applicable)	

9 Module pro-forma used to define the course content

Module Title: INTRODUCTION TO ENVIRONMENTAL SECURITY

Module Code: 1 Module Type (UG / PG): PG

University Responsible: UPM Level (4, 5, 6, 7): 5

Valid From: 2020 Credit Points: 6

Expected Length (normally 30 wks): 15 Semester (1, 2, 1 or 2 or yearlong): 1 or 2

9.1 Brief Description and Indicative Content

The major challenge concerns the global environmental change, focusing on the interactions between ecosystems and mankind, the effects of global environmental change on environmental degradation, the effects of increasing social request for resources, ecosystem services, and environmental goods. The relevant objects of environmental security are complex, adaptive systems with two main components – the social, characterized by human intent, and the ecological, rising without intent; these have interacted historically, and society strongly determines the landscape ecological components of such systems (Zurlini, Müller, 2008).

In this module we will address the main concepts related to a general vision of Environmental Security, like Human Security, Gender Security or the environmental stress as a source of conflict (the impact of wars, forest fires, droughts, etc. in the environmental security).

9.2 Intended Learning Outcomes

On successful completion of the module, the students are expected to acquire a number of generic and specific competences:

a) Generic competences:

- *Adequate language skills*: good reading comprehension skills with the topic of introduction to Environmental Security.
- *Adaptability*: flexible attitude towards changing circumstances (sectoral, design, production, innovation, history etc.) and acknowledgement of the constant need to learn new skills and new concepts in a changing environment;
- *Logical reasoning abilities*: problem identification, creative search for solutions (both well-known ones and new ones), ability to follow logical inferences and elaborate formal reasoning in issues related with resource efficiency and sustainable green growth.

b) Specific competences:

- Understanding of main environmental security issues;
- Ability to identify an environmental security hazards and conflicts;

- Understanding of history of Environmental Security;
- Capacity to conduct a resource efficiency assessment;
- Ability to understand the importance of Human Security and Gender security;
- Ability to understand the Policies in terms of Environmental Security

Assessment Regime					
(*no modification permitted until <enter date>)					
Formative/ Summative*:	Type*:	Indicative Description: (including word length and/or duration)	Learning Outcomes Assessed	% Weighting*: (indicate if pass/fail, essential element or pass mark other than 40%)	Indicative Due in Week No:
Summative	CW 1	Essay linking personal experience to supporting academic literature and research in relation to a client requiring fire prevention (2000 words).	1,2,3,4	50%	
Summative	CW 2	A case study based assignment which will ask the students to discuss an individual clients needs in relation to the evidence base (2000 words).	1,2,3,4	50%	15

Indicative Teaching and Learning and Assessment Strategies

A range of teaching and learning, strategies will be adopted to meet the needs of students who are likely to have varied experiences. They will include a weekend block of face to face teaching, comprising of 2 days of 7 hours. This will then be blended with distance learning using the online learning facilities of Moodle and Blackboard to encourage collaborative learning.

The assessment includes a 2500 word essay (CW1) which will link to all 4 of the stated learning outcomes. The student will be asked to critically evaluate an aspect of their professional work in which they have personally been involved. They will be asked to analyse how they provided management recommendations to a client with potential unsustainability incidence and contrast this with international guidelines and research. Within this scenario all learning outcomes will need to be identified and the students understanding demonstrated. The assignment guidelines will make clear these requirements.

The case study will discuss the needs of a fictitious client with environmental security history. The student will be asked to give them evidence based advice. They will be required to assess the risk based on management plans. All these elements are directly related to the learning outcomes of the module.

Skills / PDP Statement

This module provides the opportunity for students to:

Develop their knowledge and skills to deliver effective interventions within the environmental security manager.

Core Resources (texts, journals, websites)

Key Text(s) / Key Journal(s):

Unit 1:

- a) G. Zurlini, F. Müller, in Encyclopedia of Ecology, 2008.
<https://www.sciencedirect.com/topics/earth-and-planetary-sciences/environmental-security>
- b) Commission of the European Communities (2004). The EU Economy: 2004 Review. Directorate-General for Economic and Financial Affairs. Unit Co-ordination of the economic policies of the Member States and the euro area. European Commission.

- c) Barbu Constantin-Horia, Camelia Sand, Letitia Oprean (2007). Introduction To Environmental Security "Lucian Blaga" University of Sibiu, Sibiu, Romania in Strategies to Enhance Environmental Security in Transition Countries NATO Security through Science Series, 2007.
- d) Myers Norman (2004). Environmental Security: What's New And Different? The Hague Conference on Environment, Security and Sustainable Development. The Peace Palace, The Hague, The Netherlands, 9 - 12 May 2004.
- e) European Commission.
https://ec.europa.eu/knowledge4policy/foresight/topic/changing-security-paradigm/environmental-security_en
- f) United Nations, 2009. "Human Security in theory and practice". Human Security. Unit Office for the Coordination of Humanitarian Affairs. United Nations.
<https://www.unocha.org/sites/dms/HSU/Publications%20and%20Products/Human%20Security%20Tools/Human%20Security%20in%20Theory%20and%20Practice%20English.pdf>

Unit 2:

- a) Diehl P. and Gleditsch N. (2000). Environmental Conflict: An Anthology. Westview Press. 352 p.
- b) Brauch H., Behera N., Kameri-Mbote P., Grin J., Spring U., Chourou B., Mesjasz C., Krummenacher H. (2009). Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts. Springer. 1588 p.
- c) Brauch H., Behera N., Kameri-Mbote P., Grin J., Spring U., Chourou B., Mesjasz C., Dunay P., Birkmann J. (2011). Coping with Global Environmental Change, Disasters and Security: Threats, Challenges, Vulnerabilities and Risks. Springer. 1815 p.
- d) Sjoberg Laura, Ed (2009). Gender and International Security: Feminist Perspectives. Routledge, ix–xiv, 286pp.

Unit 3:

- a) Baechler Günther (1998). Why Environmental Transformation Causes Violence: A Synthesis. Environmental Change and Security Project Report, Issue 4 : 24-44
- b) European Environment Agency, 2017. How is climate change affecting forest fire risk in Europe? <https://www.eea.europa.eu/data-and-maps/indicators/forest-fire-danger-2/assessment>
- c) Allen-Gil S., Stelljes L., Borysova O. (2008). Addressing Global Environmental Security Through Innovative Educational Curricula. NATO. Springer. 238 p.
- d) Diehl P. and Gleditsch N. (2000). Environmental Conflict: An Anthology. Westview Press. 352 p.
- e) Lagutov V. (2011). Environmental Security in Watersheds: The Sea of Azov. NATO. Springer. 253 p.
- f) Liotta P.H., David A. Mouat, William G. Kepner, Judith M. Lancaster (2007). Environmental Change and Human Security. Recognizing and Acting on Hazard Impacts. NATO Science for Peace and Security Series - C: Environmental Security.

- g) Morel B. and Linkov I. (2005). Environmental Security and Environmental Management: The Role of Risk Assessment: Proceedings of the NATO Advanced Research Workshop on The Role of Risk Assessment in Environmental Security and Emergency Preparedness in the Mediterranean Region, held in Eilat, Israel, April 15-18, 2004. Springer. 325 p.
- h) Morris A. and Kokhan S. (2007). Geographic Uncertainty in Environmental Security. NATO. Springer. 287 p.
- i) Kepner W., Rubio J., Mouat D., Pedrazzini F. (2005). Desertification in the Mediterranean Region. A Security Issue: Proceedings of the NATO Mediterranean Dialogue Workshop, held in Valencia, Spain, 2-5 December 2003. Springer. 614 p.
- j) Spillmann Kurt R. and Günther Bächler Eds. (1995). Environment and Conflicts Project (ENCOP). International Project on Violence and Conflicts Caused by Environmental Degradation and Peaceful Conflict Resolution. Occasional Paper No. 14, Environmental Crisis: Regional Conflicts and Ways of Cooperation Report of the International Conference at Monte Verità, Ascona, Switzerland, 3 - 7 October 1994.
- k) DeWeerd, 2018, "War and the Environment", Worldwatch Magazine, January/February 2008, Volume 21, No. 1. <http://www.worldwatch.org/node/5520>
- l) <http://www.unssc.org/home/category/themes/peace-and-security/land-natural-resources-and-conflict-prevention>. Accessed on July 2012

Unit 4:

- a) Connelly J., and Hayward J. (2012). The Withering of the Welfare State: Regression. Palgrave Macmillan. 232 p.
- b) Gaan Narottam (2004). Environmental Security: Concept and Dimensions. Delhi, India. 318 p.
- c) Grandvoinet Helene, Hartmut Schneider, Eds (1998). Conflict Management in Africa: A Permanent Challenge. Organisation for Economic Co-operation and Development. Development Centre. 124 p.
- d) Huggins Chris, Munyaradzi Chenje, Jennifer Mohamed-Katerere (2005). Chapter 12. Environment for Peace and Regional Cooperation in Emerging Challenges, Section 3. Institute for Environmental Security, Horizon 21 (Accessed on July 2012). Advancing Global Environmental Security. Science, Diplomacy, Law, Finance, Education. <http://www.envirosecurity.org/>
- e) Petrosillo F., Müller K., Jones B., Zurlini G., Krauze K, Victorov S., Li B., Kepner W. (2007). Use of Landscape Sciences for the Assessment of Environmental Security. NATO Springer. 497 p

http://www.initiativeforpeacebuilding.eu/pdf/Conflict_Economy_International_Cooperation_and_Non_Renewable_Natural_Resources.pdf. Accessed on August 2012

Key Website(s):

<https://ec.europa.eu>



Lifelong
Learning
Programme



<https://www.unocha.org>

<https://www.eea.europa.eu/data-and-maps/indicators/forest-fire-danger-2/assessment>

<http://www.worldwatch.org/node/5520>

<http://www.envirosecurity.org/>

02-A3 Harmonisation and validation of learning modules and training paths

The aim of this report is to reflect the work carried out during the Activity 3 of Intellectual Output 3: “Harmonisation and validation of learning modules and training paths”¹. It has been done in a very close collaboration with BUCKS and UTB, lead responsables of Activities 1 and 2 of the same Intellectual Output, “Training paths definition” and “Definition of the content modules”, respectively. Thereby, both the Training Paths and the Modules have been defined attending the harmonization.

This way, once Activities 1 and 2 have been completed, the International Master Modules for Environmental Security Sector has a very well defined Training Paths and Learning Modules. Considering the competences needed in the industry that the Intellectual Output 1 indicate, these Training Paths will provide the future students the skills that the industry demands.

Thus, there have been established one research and four professional Training Paths. Students will have the option, also, of not choosing one of them, so they would be *No Specialized*. All of them, nevertheless, will have to study four mandatory modules (21 ECTS): “Module 1 – Environmental Security Assessment”, “Module 2 – International Climate Change Governance Systems”, “Module 3 – Climate Change Mitigation and Adaptation systems” and “Module 4 – Measuring Sustainability,”.

Depending of their choice of the six remaining modules, they will acquire their specialization:

- For Production, students must perform modules 1, 2, 3, 4, 5, 7 and 9.
- For Design, students must perform modules 1, 2, 3, 4, 6, 7 and 9.
- For Business, students must perform modules 1, 2, 3, 4, 5, 8 and 9.
- For Research, students must perform modules 1, 2, 3, 4, 10, and choose one from 5, 6, 7 or 8 depending on their investigation thematic.

Module 5 (Environmental Governance), 6 (Forestry, Forests and Poverty), 7 (System Thinking), 8 (Environmental Conflict Management) and 9 (Smart Environment).

In conclusion, results of O2A1 and O2A2 are well harmonized, divided and planed. Even so, until the redaction of this report it has been detected some minor overlapping of the

¹ “ENSEC” has been funded with support from the European Commission. This work reflects the opinion of the author and the Commission cannot be held responsible for any use of the information contained therein.

content between subjects, so it has been transmitted to the institutions responsible of the developing of the content of each subject. Most of them are between basic and specialization modules, so the different point of view grant that the students will acquire different competences based on the knowledges offered by the Master.

The entire content of this report has been discussed during Project Team Meeting 3, carried out in Funchal (Portugal) February 11th, 2019. Thus, it is considered that the learning modules and training paths are harmonized and validated.

GUIDELINES FOR TEACHERS

ENSEC VIRTUAL LEARNING PLATFORM

Intellectual Output 2 – Activity 4



Authors:

Eduardo Marques & Jane Spínola
University of Madeira

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Introduction

This master's course aims at the transfer of technical-professional skills, concerning the environmental security sector. It is structured into modules whereby each particular one develops a specific skill that can be recognized, within the working context, as components of developing knowledge to add to professionalism. This Master Programme intends to achieve uniform standards within the European Union.

Aims

The overall aim is to develop a well-designed scheme whereby knowledge from diverse areas can be shared and be interconnected. These areas include university education, regional, national and international natural environments and specific work environments, in order to increase the skills of professionals who may then find themselves in the capacity to contribute with the implementation of innovation processes within environmental security.

These guidelines focus on the educational elements of the master's relating to the teachers and to the organization of each module that will include different types of students: young people, employed adults and unemployed adults. Teachers will need to keep these differences in mind and will have to allow younger students the time to acquire essential basic skills at the post-secondary level. These skills will need to be directed at the current needs of the labour market, which can be involved through an integrated certification system, in order to encourage and accelerate young-students' job placement.

For adult students, who are already employed, the right to life-long learning and the updating of skills and knowledge in every phase of life ought to be encouraged starting with the completion and qualification of the skills they already possess and with the professional experience they have already obtained. For these students to become better skilled and thus promotable senior professionals, the commitment to further their knowledge and competences is of the essence.

The third type of students considered are possible candidates for this course are unemployed adults. These professionals not only require a rapid refreshing and requalification of previous knowledge and skills they may have previously possessed, but they may also need to recreate

their profile so as to venture into different professional opportunities. To be prepared for a new work environment, this course needs to be able to ensure they acquire a set of skills and basic knowledge within the field.

Teaching skills of Master's Teachers

Despite the inexistence of standard characteristics aggregated to a master's teacher, there has been information published in educational journals, periodicals, and diverse research projects, which establish numerous practices and procedures that teachers may be expected to implement during their teaching practices. For the purpose of this course, 9 effective teaching categories will be taken into account. These are as follows:

1. Knowledge of Course Content and Goals
2. Planning Skills
3. Skills in Selection and Use of Materials
4. Skills in Online Monitoring/ Facilitating
5. Skills in Human Relations
6. Online Instructional Skills
7. Community Involvement and Development
8. Professional Growth
9. Policies and Procedures

A description of traits and characteristics that are considered beneficial for teachers to have garnered in order to effectively engage with the teaching and learning experience will follow.

1. Knowledge of Course Content and Goals

The teacher should be knowledgeable and updated in the field of expertise in order for the content matter to be presented confidently and effectively. It is also expected that the teacher has the capacity to correlate different subject matter areas so the established curriculum can be cross-disciplinary when possible, enabling students to have a more encompassing learning experience.

It is of great importance that the teacher be aware of the general objectives set for the master's so as to carefully set the course goals within the expectations related to

the field of study. This enables the construction of performance objectives (Dick, Carey and Carey, 1996).

2. Planning Skills

Long-range and short-range instructional plans need to be designed and followed by the teacher. This action leads to ensuring the necessary materials, equipment, and eventual additional resource personnel in advance can be acquired. Overall responsibility of the activities for transfer of learning and the implementation of the lesson plans to meet the needs of the group lie with the teacher.

Planning materials for online teaching and learning also require a mind-set of meticulous organisation and thinking ahead. Researching and recycling materials requires time to adapt them to the teaching medium, therefore planning ahead is of the essence.

3. Selection and Use of Materials

All relevant and subject-relatable materials, which conform to the course objectives and students' needs, are the teacher's responsibility. Textbooks and other instructional materials (including articles, newspapers, supplementary bibliography, artifacts, videos, etc.) can also be used. Clear and concise instructions ought to be given by the teacher to the students for adequate use of these.

Determining the appropriate delivery media can enhance learning and diversification of materials on the same subject matter add motivation as they may appeal to a variety of students with diverse learning methods and needs. By enriching material with various sources (site links, blogs, videos), students are able to develop 'multiple perspectives on content' (Masie, 2006, p.23).

4. Skills in Online Moderating/ Facilitating

At first, the teacher is the main reference establishing class expectations at the beginning of the year, shares them with students, and consistently maintains them. Moreover, he/ she shows respect and consideration for others and expects the same traits in return and from each student towards each other. A good teacher confers privately with individual students when the need arises and deals with the unexpected in a calm, rational manner, in an effort to overcome any obstacles that may hinder communication and learning.

It is the moderator's/ facilitator's (i.e. facilitator + tutor) responsibility to enable the shift from a traditional teacher-centred environment to a student-centred teaching and learning experience, in which students are responsible for their own learning experience and that of their peers too. Supporting students throughout this process entails guiding students through the contents and activities, stimulating student-student interaction, motivating, providing feedback and managing students, their expectations, activities and deadlines.

5. Skills in Human Relations

The teacher should strive to get to know and understand his/ her students, actively listen to students, whilst moderating their interactions, and work towards the development of positive self-image within learners. This, in turn, generates a psychological environment conducive to learning. Offering positive reinforcement to acceptable academic and social behaviour whilst also holding students whose behaviour is in violation of established policy responsible is yet another role the teacher needs to play.

The development of an online community of inquiry is key to a successful teaching and learning experience. Thus, the teacher's/ moderator's guidance in promoting interaction leads to a stronger sense of group identity with a common learning goal.

6. Instructional Skills

Once the learning objectives of the established curriculum have been set, the teacher needs to certify of the appropriate level of difficulty of the learning materials and activities for the students. Assessment of student learning and understanding ought to be carried out and, if need be, adjustments to the teaching and learning methods according to emerged needs must occur. It is the teacher's responsibility to ensure students remain motivated and focused on obtaining and complying with the objectives of their learning experience.

7. Community Involvement

If and whenever possible, the teacher should rely on community resources in the learning process. These can play a role as positive models in the community, whose activities teachers and students can be actively involved in.

8. Professional Growth

It is essential for the teacher to demonstrate meaningful professional growth activities, participate in staff development and in-service activities as well as be involved in district curriculum developmental activities.

9. Policies and Procedures

The teacher should follow and act in accordance with all established policies and procedures and always have a sensible and responsible demeanour.

Commitment of Master's Teachers

As previously mentioned, this document aims to provide teachers who will be involved in master activities and classes with guidelines to apply whilst administering their own courses.

Below is a list of all commitments that each teacher is expected to fulfil:

- Ensure own presence and expertise
- Collect and interpret the students' needs
- Identify and answer punctual students' questions
- Clarity in explanations
- Respect the organizational methods of the course (practical activities, assessment, etc.)
- Ensure correct use of educational material
- Respect the timing of the lessons or presentation of contents, taking into account the course objectives and learning needs
- Respect of the course objectives
- Adoption of active teaching and moderation methods
- Proper transfer of skills
- Correct use of available tools and equipment
- Preparation of periodic learning checks to verify the levels of competence foreseen as a result of the course
- Support any other educational initiatives and practical training, closely related to the objectives of the course
- Implementation of ex-post verification measures

- Take into account that the students may have prior work commitments or learning capabilities that shape students' time management and learning methods
- Implementation of measures and teaching methods to guarantee the coverage of the credits foreseen for each module

Keeping in mind the aims of the courses and the diverse themes developed in each module, the skills and the commitment of the teacher will enhance students' increased competences and understanding of: environmental security processes, technologies, management, design, raw-materials, logistics, communication, working context, etc.

For each module teachers can follow this guide to good practices online:

- Ensure students have understood and know how to use the learning platform and that technical support is available.
- Write clear and concise instructions for each task, including aims, timelines, and expectations.
- Use clear and easily recognisable symbols to represent common tasks and activities set up online.
- Ensure students see the advantages of the learning and teaching approaches.
- Explore and exploit as many rich media sources as possible and give students room to find their own preferred learning method when there is a choice.
- Always check the quality of audio and visual materials so the content is more easily understood and explored by the student.
- Stimulate metacognitive skills so students are able to reflect upon their needs and knowledge acquisition.
- Vary the interaction methods to avoid students getting bored and move towards their interests and experiences to get them engaged.
- Remember to scaffold knowledge so students do not become overwhelmed by the bulk of information that is presented to them. (Spinola, J. pp. 269)

The Virtual Learning Platform

Module Template Guidelines

From here on this document aims to present the teachers with a template and guidelines for the creation of the Master's in Environmental Security. The template offers a proposition of a structure for each module whereby several possibilities are offered for diverse points taught in each module. Here teachers will also be able to find suggestions of a selection of resources and activities and how to use them in the design of the module. Besides the presentation of the template, there is a description of the main characteristics of the learning and teaching platform.

In an attempt to provide students with a similar learning experience throughout the different modules of the course, these guidelines only serve its purpose if viewed as a suggestion for a possible structure for the design and development of each module. As each module has diverse contents and activities, this document should be interpreted as reference for teachers and as a starting point for course development.

As a final note, it needs to be clear that the intention of this document is in no way to limit or to oblige the module creators and designers to follow a pre-determined structure, but it is to instead help and indicate a possible path for the development of the module.

The Virtual Learning Platform

Global aspects

The software platform used for supporting ENSEC¹ is a well-known Learning Management System (LMS), used on many educational levels and in a multitude of different projects, such as research projects. The platform is Moodle² and all its characteristics and functionalities are described on its web site. This document will not explain the details of the platform or how to use it but will instead indicate which components can be used throughout the Masters' modules.

The user profiles which are pre-defined for the website are: Teacher and Student. The first is responsible for the creation, design, moderation, and tutoring of the module. Most of the instructions that follow are directed at the Teacher. The Student will explore the content and will complete the defined activities designed and facilitated by the Teacher(s), who are also referred to in these guidelines as moderators and facilitators, due to the different roles that they take on during an online teaching and learning experience. The registration of the Teachers on the platform for the module(s) is monitored by the platform Manager(s). The Manager profile and the Students' registration process are not yet defined. Both are related and should be clarified after the course creation.

The delivery and completion of each module completed by students may occur in a self-learning environment with minimum support from facilitators or with full support of one in each module.

Template

The modules can be designed with two sections: Top and Unit.

In the Top section the objective is to include some general elements about the module, such as, announcements and discussion forums as well as a depository for the module's documents. The Unit sections, which as a norm, is of the same number of units as those in

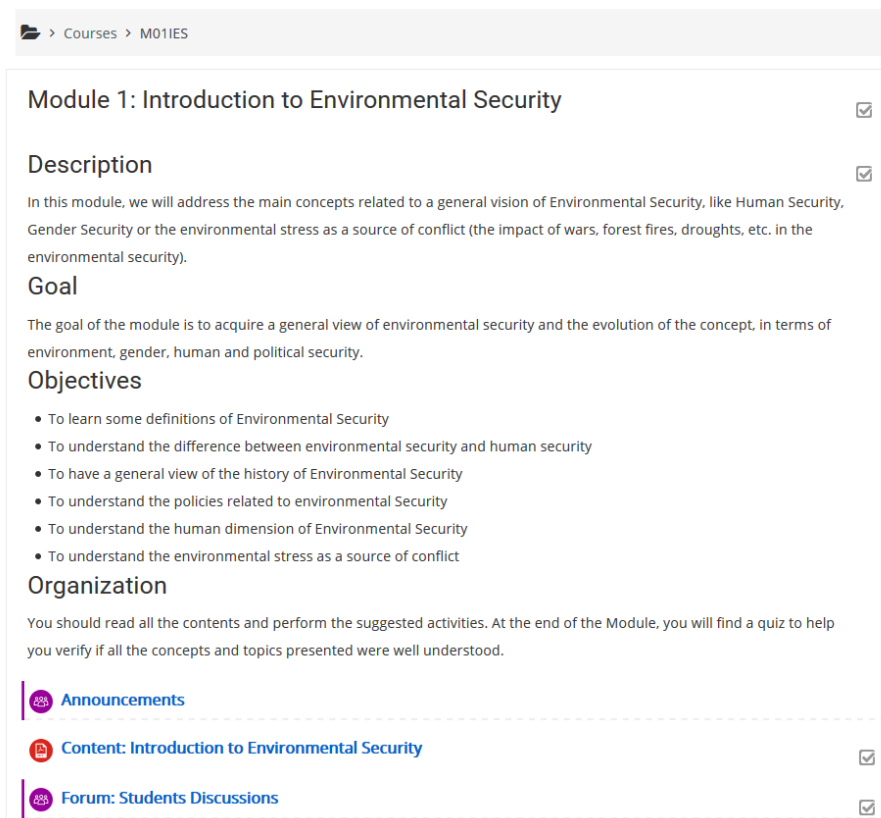
¹ ENSEC VLP website address: <https://ensec.web.uma.pt>

² Moodle Platform website address: <https://moodle.org>

the module's content, will provide the students with the resources and learning activities related to that section.

Top Section

The first section, Figure 1, of the module contains global elements for the delivery of the content. This is the only section that should be identical for all modules.



> Courses > M01IES

Module 1: Introduction to Environmental Security

Description

In this module, we will address the main concepts related to a general vision of Environmental Security, like Human Security, Gender Security or the environmental stress as a source of conflict (the impact of wars, forest fires, droughts, etc. in the environmental security).

Goal

The goal of the module is to acquire a general view of environmental security and the evolution of the concept, in terms of environment, gender, human and political security.

Objectives

- To learn some definitions of Environmental Security
- To understand the difference between environmental security and human security
- To have a general view of the history of Environmental Security
- To understand the policies related to environmental Security
- To understand the human dimension of Environmental Security
- To understand the environmental stress as a source of conflict

Organization

You should read all the contents and perform the suggested activities. At the end of the Module, you will find a quiz to help you verify if all the concepts and topics presented were well understood.

Announcements

Content: Introduction to Environmental Security

Forum: Students Discussions

Figure 1: Module top section elements

Besides the title, a short text introducing the module and the module Goal and Objectives, three other elements can still be present. These are described as follows.

Announcements forum for teachers: in this section, teachers, and only teachers, can announce news and leave any course information for all registered participants. Examples of announcements are the availability of new activities or resources, to inform of any changes in the schedule, etc. This information is also automatically sent to the course participants' e-mails.

Module X Syllabus & Content: in this section a static document (pdf document) with all the information about the module and the created content ought to be provided. This is the

document created by each partner for each module under their responsibility during this project. This document is the base study material for the student, specially if he/ she wants to study off-line. This document serves as reference for the module.

Discussion forum for the Module: it is a global forum for the course and any participant can initiate a discussion thread and participate in discussions created by others. A discussion thread can be developed around a generic question or a particular question about a unit. For example, a new report can be added by a student and he/ she can promote the discussion on the content of the report. Another example could be when a teacher leaves a challenge related to the course to motivate students to improve their knowledge. It is preferable to keep all discussions in one place, but, as an option, more discussion forums can be added throughout the rest of the module. Facilitators ought to moderate online discussions to offer scientific guidelines when necessary and to ensure the discussion follows common interactive patterns.

The previously listed elements are a minimum set that should be present in all modules. Some other elements that can also be included in this section are:

- Initial assessment: a quiz with questions to identify students' prior knowledge related to the module, normally defined by the moderator/ facilitator. As an option, a generic quiz could be added before the delivery of the modules (e.g., evaluate language, math, or other any knowledge/skills required for the course).
- Information about the administrative process or rules of the delivery of the module. After the definition of the delivery of the module, a document stating the rules for partaking in this module should be presented to the students to help them clarify any doubts about the module.
- User Manual to help in the use of the learning platform. After all the content has been placed on the platform, facilitators may decide whether a manual is required or not.

The next section provides a possible structure for each unit.

Unit Sections

As stated in the module content template, each module should be organized in Units. Each Unit of the module content should also exist on the platform but is not mandatory.



Figure 2: Resources and Activities in some Units of the module

The design of a module can be a daunting task but can be easily achieved by making use of and structuring the resources and learning activities that are available. The option suggested and presented in Figure 2 is an example where the lessons with tasks, activities and diverse additional materials can be accessed, are placed at the students' disposal and, finally, an assessment should be completed by the students. In sequence, and in detail, some of the options for creation of content and activities are explained:

Content Page.

This resource is a web page built by the Teacher in an on-line text editor, where text, images, videos, and rich formatting are available. This could be a copy of the module content, but it is advisable to adapt the content to the web. In Figure 3 a content page, and in this particular case, a video, is presented as an example.

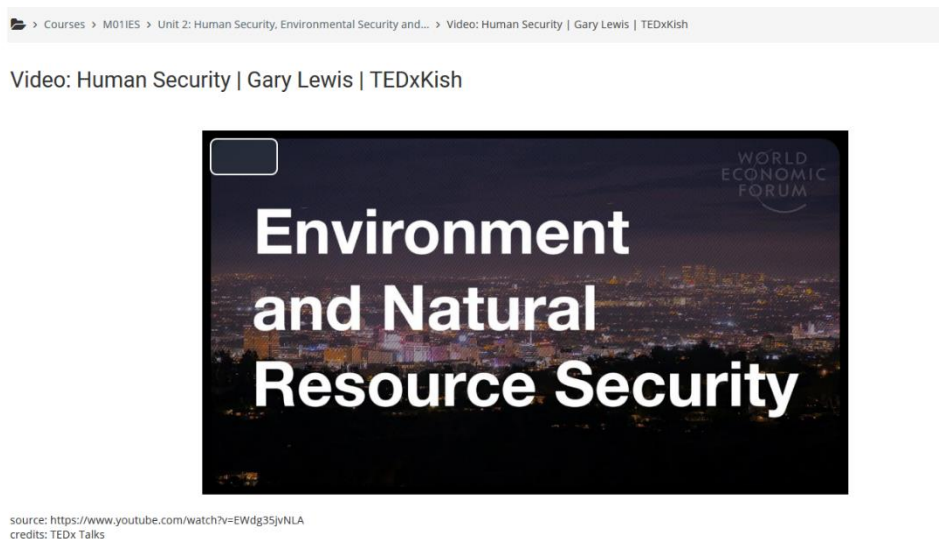


Figure 3: Content video page example in a Unit

Content can be presented in diverse manners and should be multimodal so as to appeal to multiple learning intelligences (Gardner, 1983). Suggestions include pdfs with text and images or graphs; educational videos explaining content through a variety of perspectives from different experts in the field; online forums and discussions; links to other experts' content websites or channels.

Lesson.

This is a resource where a set of pages and simple quizzes leads the student through the content and allows them to assess their own learning activity metacognitively (Bonk and Cunningham, 1998, p.29). Contrary to the Content Page where a student only has a top to bottom approach towards the information provided, with a Lesson, the Teacher has the flexibility to facilitate and guide the student along different learning paths, in which they can access diverse sources according to their needs and motivations.

Activities may include a writing assignment, a matching exercise; short or long answer questions; a True/False exercise and multiple-choice exercises.

Book.

This is a resource where Teachers design and build their content into the format of a book. Each chapter/sub-chapter of the Book is a Content Page. The Book and Lesson resources are similar in the exhibition of content, but the Lesson is more suitable when Teachers want a more accurate perception of how knowledge is being acquired by students. This is achieved by accessing the data the platform provides of student's activity on the platform when they interact with the resources. This data provided enriches the teacher's perception of the learning activity.

A Book has chapters and sub-chapters and may include multi-modal sources such as videos and links to forums. It is however not interactive.

Quiz.

In each Unit a quiz should be constructed and made available to the Students so that the Teacher (and the Students) can evaluate the learning process. This could be built using the questions referred to in the module content template.

Question 1

Not yet answered

Marked out of 1.00

Flag question

Edit question

PAHs refer to polycyclic aromatic hydrocarbons.

Select one:

True

False

Quiz navigation

1 2 3 4 5 6

Finish attempt ...

Figure 4: Example of a Quiz in the end of a Unit

In Figure 4 is an example of such a quiz, with 6 questions presenting the detail of a True or False question. Multiple choice and/or True/False questions are preferable, but other types of quizzes are also possible, such as: matching, short answer, calculated, and some others.

The diverse content elements serve only as guiding template. The element(s) selected for each Unit can either be only from one type or all the types of elements. As a suggestion, the simpler option to follow is to have a book (C) with the content and a final quiz (D) as the Book supports text, images and video, and can be organized similarly to the traditionally used written module content. It is preferable to divide the Unit into smaller learning activities. By scaffolding (Vygotsky, 1962) the contents, students are allowed to gradually construct their own knowledge at their own rate, according to their interests, motivations and needs. Metacognitive experiences (building on previously acquired knowledge, whilst consciously building one's own learning experience; Bonk and Cunningham, 1998, p.29) leads to the students receiving fewer concepts at given moments enabling them to then evaluate their knowledge acquisition before advancing towards the following ones. This type of learning can be better achieved with the design of a Lesson.

From several lists of best practices, and from the one previously provided in this document, the definition of an e-Learning course, some aspects as main concerns arise: clear and concise instructions and content presentation, student support, focus on user participation, feedback, peer assessment to optimize grading and use of clear deadlines to keep the students motivated are some of these concerns.

A last aspect, in terms of course definition, is the grading of the students' learning experiences. In each Module, a teacher can explore different options to assess students' work and participation. It is possible to grade each activity on Moodle and even add more items to

a module gradebook. The possibilities include those commonly used in a traditional face-to-face course. A simple option may be to divide the assessment of a student between the quizzes, i.e., in a module with four units we have four quizzes, being the final grade the average of the four grades.

Navigation between Units could be done in the top bar as seen in Figure 2 (E). The work screen on the platform also includes information blocks, which are automatically updated with information on the module, namely:

- Administration. For each user there are a set of options to define the course. A Teacher can configure several aspects of the course (backups, import, gradebook, course parameters). A Student can administer their registration and access their evaluation;
- Navigation. A tree structure of the courses and current module is offered to the users and they can navigate between all of the elements provided;
- Latest News. The last five announcements added by the Teacher on the Announcements Forum are displayed in this block;
- Upcoming Events. All resources and activities can be made available on specific dates. This block displays the ones that come next, reminding students of their upcoming tasks;
- Search Forums. A user can search the forums of the module for a word or set of words and receive a list of discussion forums where those words appear;
- Recent Activity. The platform updates this block for each user access, providing information about new and updated elements since their last visit.

The Moodle platform also has other resources and activities to develop a rich and interesting module. The description of the referred elements and others also available on Moodle can be found in <https://docs.moodle.org>. The platform is also flexible to accommodate content developed on other platforms or tools, such as Adobe Flash (<http://adobe.com/flash>) animations for activities or Hot Potatoes for quizzes and exercises (<https://hotpot.uvic.ca/>).

Use of the Template

All ENSEC project teachers have access to the Template in the e-Learning platform (<https://ensec.web.uma.pt/>). To use the template in each module, a Teacher will use the option Import/Restore under Administration. In the subsequent screen the Teacher should select the

template course file, typically called 'ENSEC_Course_TEMPLATE.mbz'. Then, in the following screens, teachers have several options to replace or add the desired elements to their module.

The selection of the several options during the import should be done carefully, as it is possible to replace all elements, i.e., to delete all contents and add new ones. It is recommended that a backup be made before importing if there already are some resources and activities available in the module. This operation should always be executed before the delivery of the course to students.

References

Bonk, C. J., & Cunningham, D. J. (1998). Searching for learner-centered, constructivist, and sociocultural components of collaborative educational learning tools. In C. J. Bonk & K. S. King (Eds.), *Electronic collaborators: Learner-centered technologies for literacy, apprenticeship, and discourse* (p. 25–50). Lawrence Erlbaum Associates Publishers.

Dick, W., & Carey, L. (1996). *The systematic design of instruction* (4th ed.). New York: Harper Collins College Publishers

Gardner, H. E. (1983). *Frames of Mind*. New York: Basic Books.

Mason, Robin, (2002) Review of E-Learning for Education and Training in Banks, S. et. al. (Eds.), *Networked Learning 2002. A Research Based Conference on e-learning in Higher Education and Lifelong Learning*, (pp. 19-23) Sheffield, Networked Learning Conference Office

Spinola, Jane (2014) *B-learning and the teaching of writing in English in an EFL context: an action research study*. PhD thesis, University of Warwick.

Vygotsky, L. S. (1962). *Thought and language*. Cambridge MA: MIT Press.